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(71) Applicant: **SONY ELECTRONICS INC.**
Park Ridge, New Jersey 07656-8003 (US)

(72) Inventors:
- **Noguchi, Fujio**
  Ridgewood, New Jersey 07450 (US)
- **White, Gail Karen**
  Hackensack, New Jersey 07601 (US)
- **Gioscia, Richard**
  Mahwah, New Jersey 07430 (US)
- **Jordan, Peter**
  New Hope, Pennsylvania 18938 (US)
- **Blaszkowski, Setsuko Watanabe**
  San Diego California 92127 (US)
- **Akaiki, Kazuhiro**
  Setagaya-Ku (JP)
- **Schaffer, Mark**
  Hackensack, New Jersey 07601 (US)
- **Kotabe, Noriko**
  Canton, Cardiff, CF5 1AG (GB)
- **Otani, Takashi**
  Soka-City, Saitama 340 (JP)
- **Kajiwara, Tadashi**
  San Diego, California 92128 (US)

(74) Representative: **Cotter, Ivan John et al**
D. YOUNG & CO.
21 New Fetter Lane
London EC4A 1DA (GB)

(54) On screen programme list display for multiple channel broadcasting systems

(57) An easy to use on-line guide provides the user of a multiple channel television broadcast system with a wealth of programming information in a simple format that is easy to understand. The guide enables the user to easily select a particular program to watch. In particular, when the guide is presented to the user, the guide covers only a portion of the actual television screen or display. The remaining portion of the television screen continues to broadcast the audio and video of the currently selected program. As a user scans through the guide and moves the pointer from one station to another, the system responds by automatically tuning to the channel pointed to by the pointer and provides the audio and displays the video in the portion of the screen not covered by the guide. Furthermore, a written description of the program currently broadcasted on a station that the cursor currently points to is also shown. In addition, the system provides an innovative mechanism to enable the user to scan program information of channels that the user has designated as his favorite channels. In another embodiment, a program list that is oriented according to the program, instead of the channel, is presented.

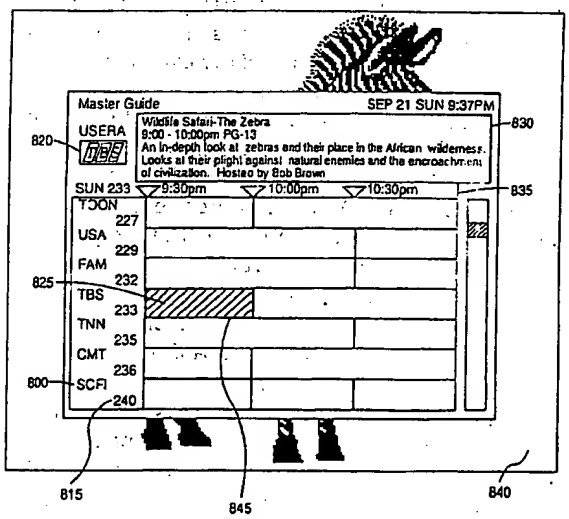

FIG. 8

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tions.

In another embodiment, the present invention presents a guide that is oriented according to the program instead of the channel. In particular, the guide provides program information and broadcast time information. The guide is organized in an XY grid with the X axis displaying a certain block of time (e.g., two hours) and the Y axis displaying program information organized independently of channel information. For example, the Y axis may display program titles organized in alphabetical order. The X axis displays the time or times each program is displayed by highlighting the corresponding time slot. Other embodiments provide the generation of the program guide according to the category of programming the user is interested in.

The invention will now be further described, by way of illustrative and non-limiting example, with reference to the accompanying drawings, in which:

Figure 1 is a simplified illustration of a prior art direct digital satellite system guide display.

Figure 2 is a simple illustration of one embodiment of the present invention.

Figure 3 is a block diagram representation of elements utilized in the receiver of the television signals.

Figure 4 is a representation of a remote control utilized to tune television stations.

Figure 5 is a simplified block diagram of circuitry utilized in a remote control device.

Figure 6 illustrates the type of data utilized to present an electronic program guide.

Figure 7 illustrates the pointers to the data utilized to generate the electronic program guide.

Figure 8 illustrates a Master Guide presented to enable the viewer to view programming that is broadcast and is to be broadcast.

Figures 9A, 9B and 9C illustrate one embodiment of the present invention in which a broadcast audio and video is displayed behind the Master Guide to enable the viewer to easily determine programs to watch without the need to navigate through multiple levels of menus or to switch between menus and broadcasts.

Figure 10 is an exemplary flowchart illustrative of the functionality provided in one embodiment of the present invention.

Figure 11 is an illustrative display of a channel banner.

Figure 12A is an exemplary display of the main menu of one embodiment of the present invention.

Figure 12B is an example of the system menu in one embodiment of the present invention.

Figure 12C is illustrative of a custom setup menu in one embodiment of the present invention.

Figure 12D and 12E illustrate the electronic messages feature.

Figure 12F illustrates the skip stations feature available to the user.

Figure 13A is an illustrative display of a category selection guide.

Figure 13B is an illustrative display of a subcategory guide.

Figure 13C is a descriptive flow diagram illustrating the selection of categories and subcategories.

Figure 14A is an illustrative display of a displayed station index.

Figure 14B is a descriptive flow diagram illustrating the use of the station index of Figure 14A.

Figure 14C illustrates the selection of a station using the station index.

Figure 15 is an example of an electronic programming guide.

Figure 16A, Figure 16B and Figure 16C illustrate the use of a user's favorite stations function.

Figure 17 is an illustration of the favorite station guide.

Figures 18A and 18B illustrate menus for setting up the user favorite stations.

Figure 19 is a flow diagram illustrating the process of moving among channels having the same programming category.

Figure 20 is a simple block diagram of the components of the program list.

Figure 21 is an exemplary flow diagram illustrating a process for generating the program list display.

Figure 22 is an exemplary flow diagram illustrative of the process for using the program list.

Figure 23 is an exemplary display of the main menu of one embodiment of the present invention.

Figure 24 is an example of a display used to select program categories in one embodiment of the present invention.

Figure 25 is an illustrative display used to select subcategories.

Figure 26 is an illustrative display of a program list.

Figures 27A and 27B are illustrative displays to enable the user to purchase pay-per-view programs.

Methods and apparatus in accordance with preferred embodiments of the invention will now be described. In these methods and apparatuses, the broadcast system described is a direct broadcast satellite system. However, it is readily apparent to one skilled in the art that other broadcast systems which have the capability of receiving and displaying a multiplicity of stations may utilize a method and/or apparatus embodying the invention. Furthermore, in the following description, for purposes of explanation, numerous details are set forth, such as menus, flowcharts and system configurations, in order to provide a thorough understanding of the invention. However, it will be apparent to one skilled in the art that these specific details are not required in order to practice the invention. In other instances, well known electrical structures and circuits are shown in block diagram form in order not to obscure the present invention.

Figure 2 is a simplified diagram illustrating a Direct Satellite System (DSS). The system has an antenna 3, an integrated receiver/decoder 2 (IRD), a remote con-

mitting code. The transmitting code is sent to the infrared originating device 405 through an output port and converted into an infrared signal. The infrared signal is transmitted to the IRD. The operation buttons 410 include a direction key for designating a pointer direction such as north, south, east and west, an "EPG" key, a "FAVORITE" key, a "SELECT KEY", a "MENU" key, an "EXIT" key, a ten-key numeric keypad and an "ENTER" key. The set of operation buttons 410 enable the user to select programs through the electronic programming guide.

Figure 6 is a block diagram illustration the data stored in a portion of the data buffer RAM 51. As noted above, the RAM 51 stores EPG data including guide data, channel data and program data. General information is included in the guide data, for example, the current data and time. The transponder list identifies the number of the transponder transmitting a segment. The channel list identifies the channel number of the first channel of a portion of data. The channel data includes data relating to channels, such as the channel number, channel name (i.e., the call sign of a broadcast station), logo ID (i.e., an identification of the channel logo), data ID, which is an identification of a channel number of MPEG video data or MPEG audio data, number of programs, which identifies the number of programs to be transmitted on a channel during a predetermined time frame, first program offset which identifies the offset from the header to the first channel data in a segment.

The program data includes the program title, start time of the program, time length of the program, program category such as movies, news, sports, etc., program sub-category such as drama, horror, children's movies or baseball, basketball, football for the sports category, the movie rating and program description that provides a detailed description of the program.

Figure 7 illustrates how pointers to the EPG data is sorted for display of a guide on the user's television screen. As noted above, EPG data includes guide data, channel data and program data which are stored in the Data Buffer (RAM) of IRD (as shown in **Figure 3**). When a viewer selects a channel, the CPU of the system determines the packet containing the channel information and extracts the transponder number from the channel information. The system front end starts tuning in the frequency of the designated transponder so as to receive the data transmitting from that transponder. If a viewer does not select any channel, the last channel is designated.

As noted above, the CPU generates a table of pointers 736 to the EPG stored in the memory. The table 736 is used for changing the order of channels or programs according to the information to be presented in the guide to the user. The table 736 includes an entry for the address pointer to the corresponding channel data and an entry to the corresponding program data.

A table for generating display information is stored in the ROM 37. Certain data from the table is read out from the ROM 37 and stored in DRAM 25a. Preferably the data is stored in compressed form. Therefore, when a character is displayed on a screen, the compressed character array is decoded so as to generate the character to be displayed. The encoder references a dictionary which includes a set of words and frequently used portions of words and numbers corresponding to each word or portion of a word. The encoder encodes each word to each number by using the dictionary. The decoder references the same dictionary as the encoder to perform the decode function. Once decoded, each character of the decoded word includes a character code corresponding to an ASCII code. Nonvolatile memory (e.g., EEPROM 38) has two tables. The first table contains character bitmaps in the different fonts available for each character. The second table identifies the address in the first table at which to extract the character bitmap. The address is determined according to the character code. The bit map image of the character is transmitted to DRAM 25a and subsequently accessed to display the character on the screen.

In the present embodiment, the channel data is received from a predetermined transponder and the channel number and channel name are stored in DRAM 25a. Additional channel information such as the channel logo is stored in the ROM 36. The ROM 36 preferably includes a table of Logo IDs and the address of Logo Data stored in ROM 36. Therefore, once a Logo ID is determined, the address of the Logo Data is determined, retrieved and stored in DRAM 25a.

The channel data provides the beginning address of the program data for a particular program. The actual location on the screen the program information is displayed is dependent upon the format of the guide. For example, in a time-based system, the location where the program title is displayed is determined by the start time and time length stored in the program data.

Using this information downloaded from the satellite transmission, programming and channel selection information is provided to the viewer. In the present system and method, this information is provided to the user in an innovative manner in order to enable the viewer to easily determine and select stations or programs to be viewed. For example, Figure 8 illustrates a Master Guide that provides such information as the channel call sign 810, channel number 815 in the system, the channel logo of the selected station 820, a highlight 825 indicating the location of the system pointer operable by the arrow direction buttons, a program description 830 for the program the system pointer is located at, as well as program time information 835.

This guide is superimposed on the broadcast of channel 840 at which the system pointer is located. Thus, the user not only is provided the television system data showing the television channels, times of broadcasts of programming and descriptions of programs, but is also provided the audio and video of one channel, all on the same menu level of the guide. By movement of

setup menu, the user can personalize guides and menus utilized when operating the broadcast system. For example, referring to **Figure 12C**, the custom setup menu 1270 provides options such as the setting of favorite stations 1275, setting default language 1280, setting stations to skip when reviewing stations (skip stations) 1285, and setting locks to stations and limits on viewing 1290. The user also has the option of exiting the entire menu whereby the broadcast is completely displayed on the screen 1295, or going back to the system menu, **Figure 12B**, 1297.

Figure 12F is illustrative of the skip stations feature provided to the user. The user simply moves the system pointer to highlight a station, e.g., station 100, and depresses the selection button to select the station. Thereafter, when scanning or "channel surfing" stations, the selected station(s) are skipped. Furthermore, it is preferred that the station guide (**Figure 14A**) does not show skipped stations. In addition, it is preferred that the system provide a custom guide in the format similar to the Master Guide of **Figure 8**, except that channel and program information are only displayed for non-skipped channels. The custom guide is accessed through the "other guides" item in the main menu. The custom guide is shorter because skipped station information is not displayed and unused areas due to the stations skipped are removed from the guide. Furthermore, the custom guide provides information regarding only those channels the user is interested in.

On the main menu an innovative feature referred to herein as "other guides" 1210, enables the user to select a particular category of programs to view on a guide. For example, a selection of the other guides, item 1210 on the main menu 1201, will bring up a display such as shown in **Figure 13A**. **Figure 13A** is an example of categories which may be distinguished. Referring to **Figure 13A**, exemplary categories are movies, sports specials, series, news and shopping. Once a category is selected, a subcategory menu is displayed, an example of which is shown in **Figure 13B**, which displays subcategories related to the selected category, movies. Selection of the "all" button 1305 selects all the subcategories. Otherwise, through manipulation of the pointer, certain categories can be selected. If the user selects certain categories as a preference, those programs that meet the category criteria are displayed more prominently than the remaining programs. The actual locations in the guide remain the same so as to provide the user program information regarding all stations; however by displaying the programs of the selected category/subcategory more prominently, the user can easily focus on the type of programming he prefers.

Figure 13C illustrates utilization of the pointer to select categories and subcategories. Referring to **Figure 13C**, at step 1355 the other guides display of the main category is shown. The sports category is pointed to as represented by the highlight. At step 1356, the pointer is moved using the left arrow to the movies category. At step 1357, the select button is entered to indicate that the movies category is selected. The system responds by displaying the subcategories for movies.

The user then has the opportunity to select all, in which all categories are highlighted as shown in the display of step 1357, or the user can select one or multiple subcategories as shown in display of step 1358 in which the Comedy Guide is shown. The down arrow key is then used to move to the Fantasy Guide, step 1359. The user then depresses the select button to show that the fantasy Guide has been selected, step 1360. The right arrow button then moves the display pointer to the OK button where the user can select again to indicate that his selection is complete, 1361. At this point a guide or list of programs meeting that criteria is displayed, step 1362. This display preferably includes all programming for the channels but highlights those that meet the selection criteria of the user. The advantage to this is that the user is provided the category of programs he selected but is still provided information regarding other programming. The guide then permits the user to move from the station to station that meet the selected categories, to enable the user to select the programming desired.

Referring back to **Figure 10**, if the select button is pressed, the system responds by providing the station index, step 30. An example of a station index is shown in **Figure 14A**. The station index provides a simple but effective way to give the user the information regarding available stations and the ability to easily preview stations without specifically moving sequentially through each channel number. The icon provides a visual means by which the user can associate the station in order to determine which stations he wishes to preview and possibly select for viewing. Thus, using the station index 1400 and moving the system pointer, in the present illustration by using up, down, right, and left arrow keys to highlight a particular box surrounding a station icon, the user can preview the audio and video currently broadcasted to determine whether it is desirable to select that station and view.

When the user moves the system pointer to a box surrounding a different station logo and channel number than that currently tuned to and displayed on the screen, the system responds to the movement of the pointer by tuning to the channel, outputting the audio through the television speakers and displaying the video beneath the station guide such that user gets an idea of the current program on that channel. If the user wishes to exit the station index, the tuned signal that is currently displayed is removed and the system tunes back to the channel the system was tuned to at the time the station index was selected. Thus, the user can scan programs on a channel by channel basis and simply exit if the he finds nothing of interest to view. However, if the user finds a station he wishes to view, he simply depresses the select button (for example, the center button of the arrow keys of the remote) and the station index display

ods can also be used. **Figure 16C** is a block diagram illustration of still another display of favorite stations referred to as the favorite station guide. This is entered through the main menu and will now be described in detail with reference to **Figure 17**.

Referring to **Figure 17**, included in the favorite station guide is a wealth of information that enables the user to determine at this display information regarding the programs currently broadcast on the favorite stations. The favorite station guide is entered in through the main menu. When selected, the favorite station guide will show in the background the currently tuned station and the audio of the currently tuned station. When entering the guide, the exit to current station box 1705 is displayed as highlighted, enabling the user to immediately return by the program he was viewing at the time he entered the guide. Thus, the user has access to seven favorite stations. Each box includes the channel logo and channel number 1708-1710, and the programming currently broadcasted on those stations 1712.

The user can use the system pointer to move among the favorite stations. The system in response to the movement of the pointer will tune the system to the station the pointer is currently located at. If the user finds a channel he wishes to view after previewing using the favorite station guide, the user simply selects the station, automatically exiting the station guide, and the system responds by removing the display of his favorite station guide leaving the entire tuned video image. If the user does not wish to view any of the programs listed in the favorite station guide, the pointer is moved to the previous box and selected. The system responds by exiting the favorite station guide and also automatically tuning back to the station the system was tuned to prior to entering the guide. Thus, the user can easily scan programming on his favorite stations and either select one of these to view or go back to the station he was viewing at the time the guide was entered.

Figures 18A and 18B illustrate the menus for setting up the user favorite stations. This is entered into through the custom setup menu. Once this is selected, the display, an example of which is shown in **Figure 18A**, is generated. The user can then modify or setup stations to be included in his favorite stations. The favorite stations currently programmed in will be displayed for each user on this menu. The user can then select a particular user set of favorite stations and the set favorite station menu, an example of which is shown in **Figure 18B**, will be displayed.

Referring to **Figure 18B**, The upper portion of the menu 1850 displays the current settings of favorite stations. The lower part 1860 shows all possible stations which the user can select to update the current favorite station list. The scroll bar indicates to the user where in the table of stations the currently displayed stations are located 1865. The user has two methods to update favorite stations. The box highlighted in the favorite stations is currently selected 1850 and identifies the box that can be modified at this point. The user can then change the station noted in that favorite station box by entering in the channel number directly using the numeric key pad on the remote control, or by moving the pointer to the station shown on the display 1860. For example, by entering in the down arrow key the user will move from the box 1863 down to the grouping 1860 where selection of a replacement favorite station can be performed. When a select button is depressed the station currently noted by the pointer will replace the favorite station 1863. This method provides a graphic presentation for users to easily identify stations by their logos to select favorite stations to utilize in the selection of programs to view.

In today's broadcast systems additional information such as categories of program, for example sports, movies and comedy, are provided with the transmissions of the actual broadcast. The term "channel surfing" is quite well known. When channel surfing, a viewer or user is simply using his channel "+" or "-" keys to move or surf sequentially from channel to channel in ascending numeric order or descending numeric order. In the present system, however, this technique of channel surfing is somewhat modified. This is explained with reference to the flowchart of Figure 19.

Referring to **Figure 19**, at step 1900, the system is currently tuned to a station broadcasting the current programming. This may be, for example, a sports program. The user may want to see what other sports programs are provided. Certain buttons on the remote may then be responsive to the user's desire to see other sports programs. These other programs may be selected through the guides and menus described previously; however, in the present embodiment, the user can utilize the pointer keys used for electronic guide keys, e.g., the pointer direction keys, to indicate to the system that the user wishes to simply channel surf among all sports programs in accordance with the direction indicated by the button depressed. Thus, if one of the arrow keys is depressed at step 1905 the system will take the determined category of the programming, step 1910, and then use the category indication to find another station having the same category of programming, step 1915, and tune to that station. The user can repeatedly perform this process until he finds a station that he wishes to view, enters in a menu or guide, or exits the system, step 1920. Thus, the guide arrow keys which are not used when the guide is not displayed on the screen, as opposed to the channel arrow keys, may provide a dual function for those viewers who wish to simply move from station to station having a certain type of programming.

Other variations are also contemplated. For example, if the control device includes 4 direction keys, right, left, up, down, the system responds to the up and down keys to perform sequential channel to channel tuning. The user uses the right and left direction keys to perform category channel to channel tuning. Additional functionality includes utilizing the electronic programming guide

display and displays the list generated, step 2950, to the user.

Once the program list is displayed, the user can view in a clear informative format program descriptions, categories/subcategories and channels which broadcast a particular program at a particular time. Furthermore, the user can purchase pay-per-view programming and select currently broadcasted programming to view.

An example of a program list display is shown in **Figure 26.** The program list includes a list of programs 2605, sorted alphabetically, that meet the category criteria and the times the programs occur. The times the programs are to be broadcasted are identified by the time bars 2610, 2615, 2620. Programs currently broadcasted are identified by the left arrows 2625, 2630.

The user can manipulate the system pointer to review information regarding a particular program or occurrence of a particular program. In the present embodiment, the pointer is reflected by a highlighted area of the display. However, other types of pointers, such as an arrow superimposed on the display at the location of the pointer, can be used. An exemplary user interface process to the program list is illustrated by the flow diagram of **Figure 22.**

Referring to **Figure 22,** once the program list is displayed, step 2210, the system monitors the movement of the system pointer, step 2215, as is indicated by depressing the menu up, down, right, left keys on the remote or front panel, or by movement of a joystick or similar pointer control device. When the pointer is moved to point to a different program, the system responds by retrieving the program information and displaying the program information, step 2220, in the program data area (2645, **Figure 26**). In addition, referring to **Figure 26,** the system displays subcategory of the program 2653, the channel the program will be broadcasted on 2650, channel logo 2655, time of broadcast 2657 and program rating 2659.

In the present embodiment, movement of the pointer to the position of a particular start time block, e.g., 2610, will provide the program description 2645 of the corresponding program and the channel information 2650, 2655 and complete program time information 2657 for the particular broadcast. In alternate embodiments, the user can also move the pointer to point to the program title 2605. In this instance a default standard is used to generate the channel and program time information. For example, information regarding the current or next broadcast of the program is displayed.

This program list is superimposed on the broadcast of a channel if the system pointer is located at the location of a currently broadcasted program. Thus, the user not only is provided the program information, but is also provided the audio and video 2665 of the broadcasted program, all on the same menu level of the program list. By movement of the system pointer (in the present example, by manipulation of the information highlighted), the system will automatically tune to a channel if the program identified by the program list is currently broadcasted, enabling the user to stay in the menu while still previewing in part the broadcasted channel. Therefore, referring back to **Figure 22,** if the pointer is pointing to a currently broadcasted program, step 2225, the system tunes to the channel providing the broadcast, step 2230. The user then has the opportunity to select the program to view, step 2235. If the user selects a program to view, for example, by depressing the select button on the remote control device, the system will exit the program list, step 2240, providing the user unobstructed video of the selected program.

As noted above, the program list provides the user easy way to purchase pay-per-view programming. At step 2245, if the user moves the pointer to a program start time of a pay-per-view program, the system responds by providing a purchase menu. An example of a purchase menu is shown in **Figure 27A.** Using the purchase menu, the user can select to purchase the program in advance or at the time of broadcast. Referring to **Figure 27A,** if the user wishes to see a listing of other broadcast times for the selected program he selects the "Times" button 2705. The system responds by providing a listing of other times as shown in **Figure 27B.** Selecting a particular time, as evidenced by the check mark 2710, and selecting OK, enables the user to purchase the program to view.

Referring back to **Figure 22,** once the user is finished reviewing the program list, he exits the list, (e.g., **Figure 26**) step 2255 and is returned back to the broadcast he was viewing prior to entering the program list. If the user wishes to view the programming in a different timeframe than that identified by the time bar 2670, the user moves the system pointer to the time bar and uses the pointer to move the pointer to the extreme left or right of the time bar, thereby causing the time bar to scroll in the corresponding direction. The system responds by extracting the programs of the selected category which have broadcasts in the timeframe displayed, sorting the programs and updating the display.

The invention has been described in conjunction with the preferred embodiment. It is evident that numerous alternatives, modifications, variations, and uses will be apparent to those skilled in the art in light of the foregoing description.

Claims

1. In a multiple channel broadcasting system in which programs are broadcasted for display on a screen, a method for generating an on-screen guide for a user to select channels to view, comprising the steps of:

   selecting at least one channel as the user's favorite channel;

over the broadcast on the screen, such that only a portion of the video of the broadcast is covered by the electronic program guide:
wherein the user can view the electronic program guide while still receiving the audio and a portion of the video of the broadcast.

8. The method as set forth in claim 7, further comprising the steps of:

said user using a control device comprising a numeric keypad to indicate selection of a menu enabling the user to operate different functions of the system;
said system replacing the electronic program guide with a menu comprising nine elements arranged in a 3x3 matrix, said matrix corresponding to a 3x3 matrix of the numeric keypad on the control device, each of said nine elements identifying different functions of the system;
wherein the user can easily select different functions of the system.

9. In a multiple channel broadcasting system in which programs are broadcasted for display on a screen, a method for generating an on-screen guide for a user to select channels to view, comprising the steps of:

displaying a time bar identifying times of programming on the channels in the broadcasting system; and
said user reserving future programming at selected times to view; and
highlighting on the time bar those times reserved by the user.

10. In a multiple channel broadcasting system in which programs are broadcasted for display on a screen, a method for viewing programming on different channels comprising the steps of:

broadcasting a first program on a first channel, said first program of a first category of programs;
using a control device, said user using direction control means to move to another channel broadcasting a program of the first category;
said system responding to the direction control means to tune to the channel broadcasting the program of the first category;
wherein the user can view successive channels broadcasting the same category of programming without using the electronic program guide.

11. A multiple channel broadcasting system comprising:

a receiver for receiving broadcasting data, said receiver comprising a tuner for tuning a selected channel;
a screen for displaying video of broadcasts of programs;
at least one speaker for outputting audio of broadcasts of programs; and
an on-screen electronic program guide identifying channels in the broadcast system, said on-screen electronic program guide superimposed over a portion of video of a broadcast on a channel tuned to by the tuner such that the audio is output through the speakers and only the portion of the video of the broadcast is covered by the electronic program guide;
wherein the user can view the electronic program guide while still receiving the audio and a portion of the video of the broadcast.

12. A multiple channel broadcasting system comprising:

an electronic program guide comprising channels and programs on each channel, each program is identified by a category, said programs that are identified to be a selected category are highlighted;
wherein all programming can be viewed and the selected the category of programs is highlighted for easy viewing by the user.

13. A multiple channel broadcasting system comprising:

a receiver for receiving broadcasting data, said receiver comprising a tuner for tuning a selected channel;
a screen for display of broadcasts of programs, said screen displaying a first program broadcasted on a first channel, said first program of a first category;
a user control device comprising a direction control means to move to another channel broadcasting a program of the first category;
said system responding to the direction control means to tune to the channel broadcasting the program of the first category;
wherein the user can view successive channels broadcasting the same category of programming without using the electronic program guide.

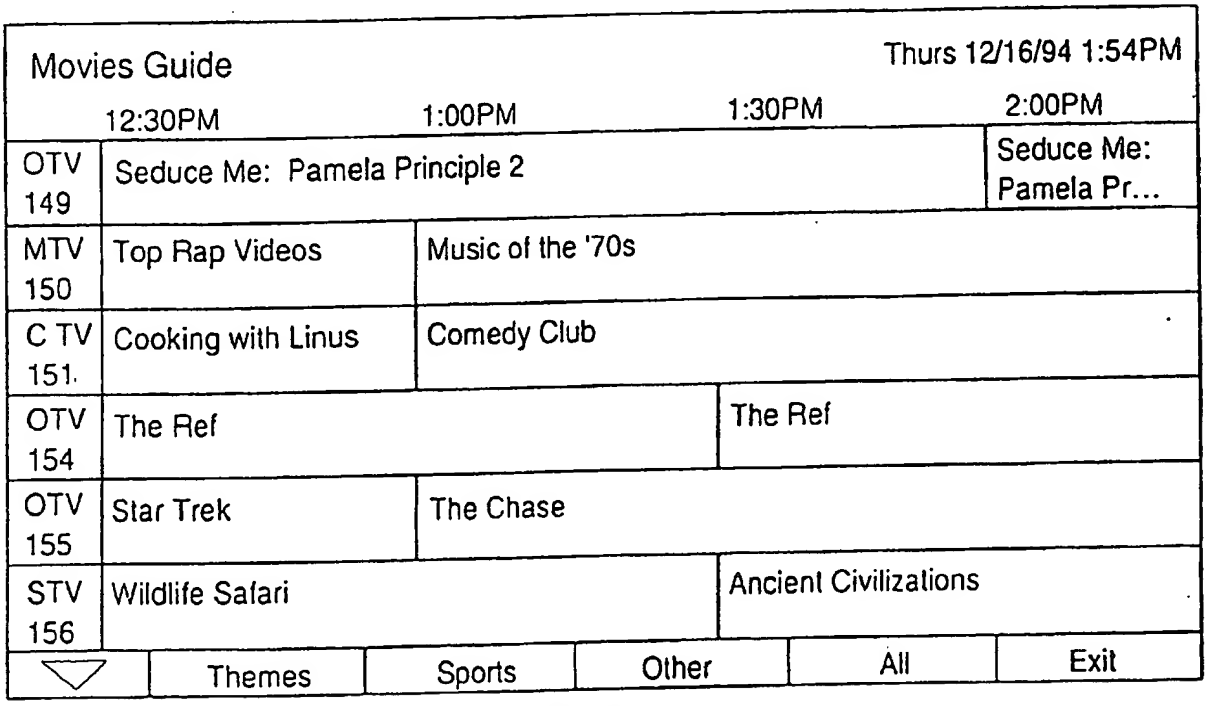

FIG. 1
(PRIOR ART)

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RNS page

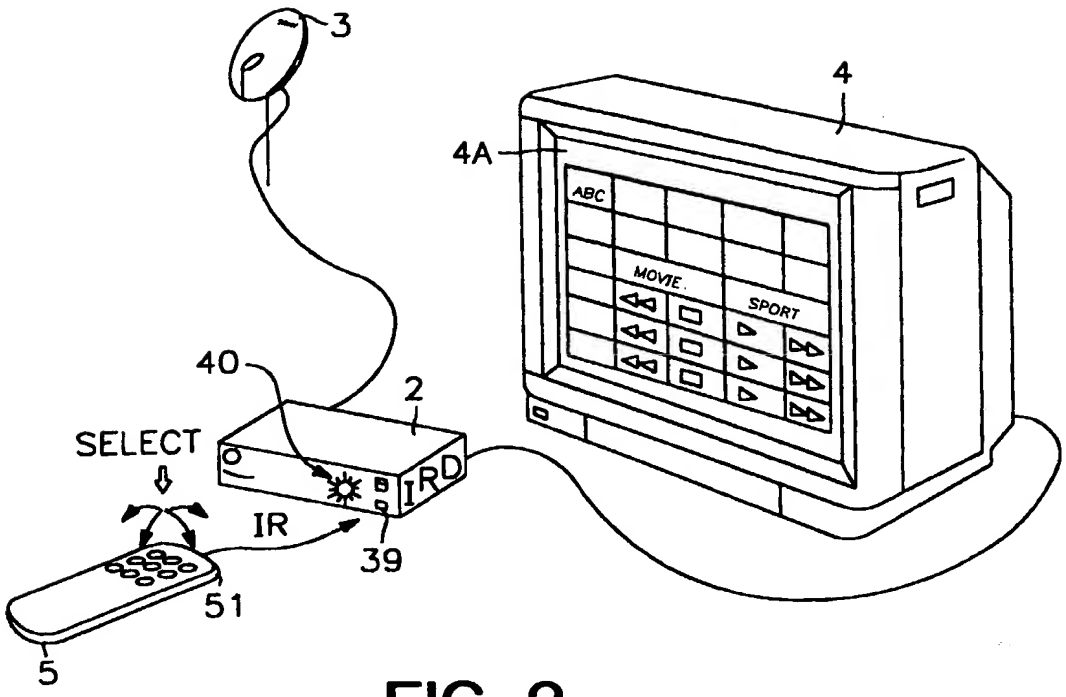
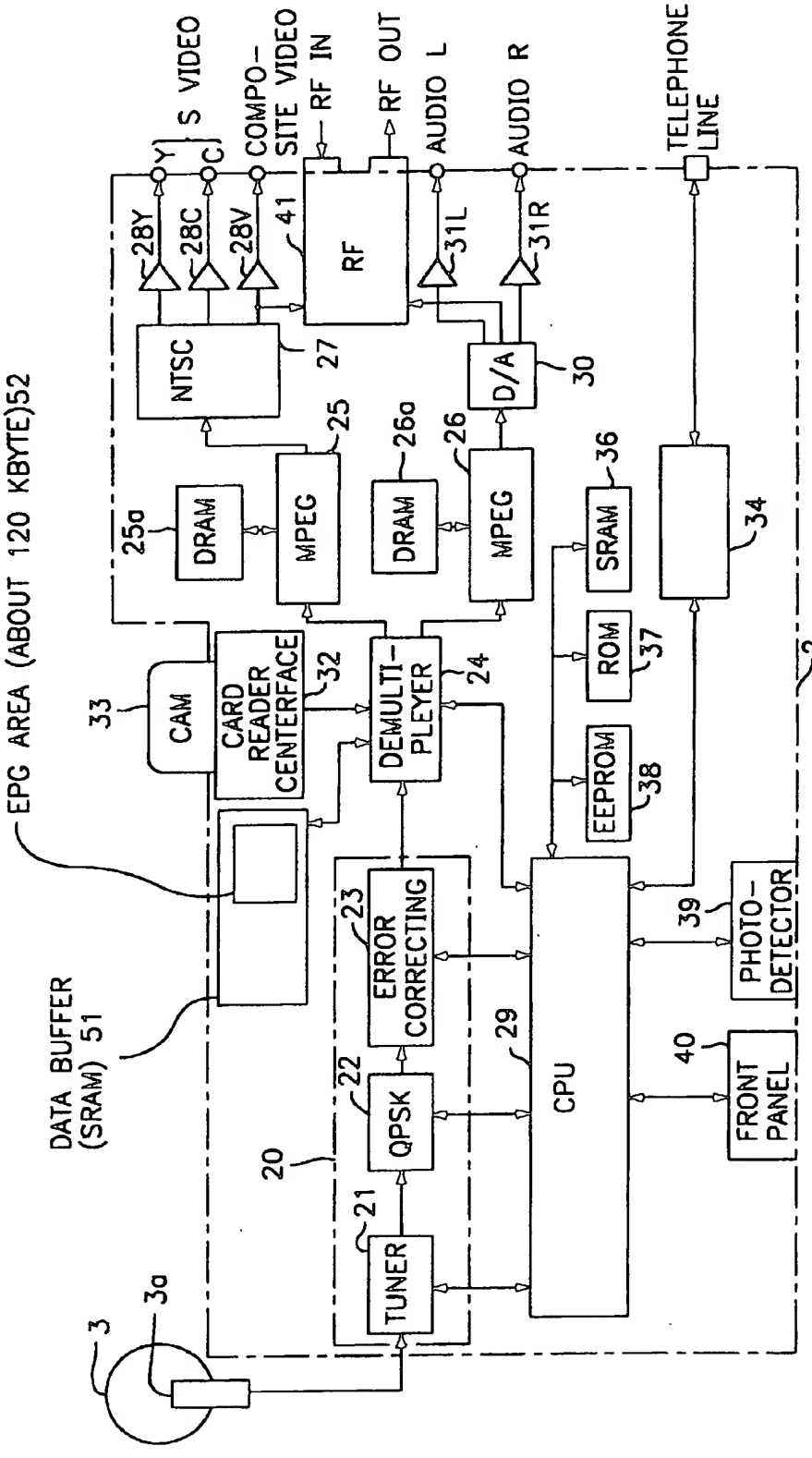


FIG. 2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Y
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COMPO-SITE VIDEO
RF IN
RF OUT
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28V
41
RF
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31R
NTSC
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ROM
37
2
EEPROM
38
23
ERROR CORRECTING
39
PHOTO-DETECTOR
20
22
QPSK
29
CPU
40
FRONT PANEL
21
TUNER
3
3a

FIG. 3

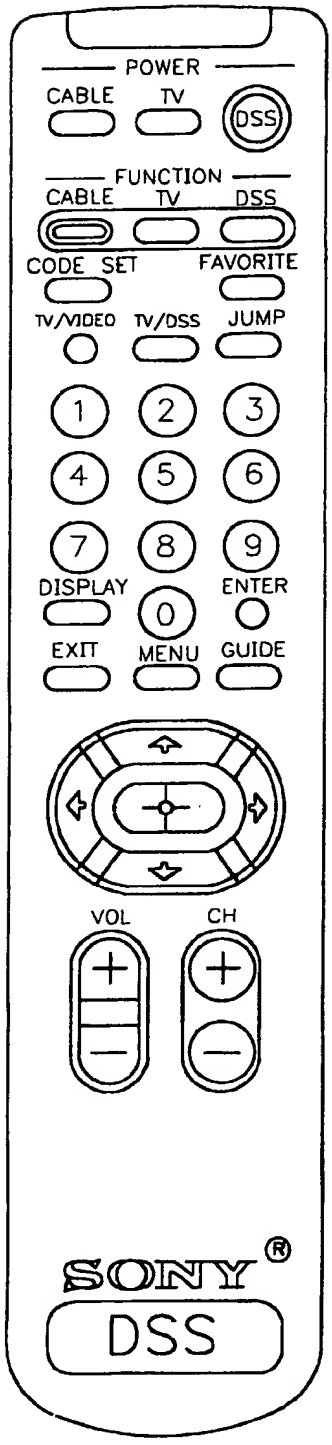
POWER
CABLE
TV
DSS
FUNCTION
CABLE
TV
DSS
CODE SET
FAVORITE
TV/VIDEO
TV/DSS
JUMP
1
2
3
4
5
6
7
8
9
DISPLAY
0
ENTER
EXIT
MENU
GUIDE
VOL
CH
SONY®
DSS

FIG. 4

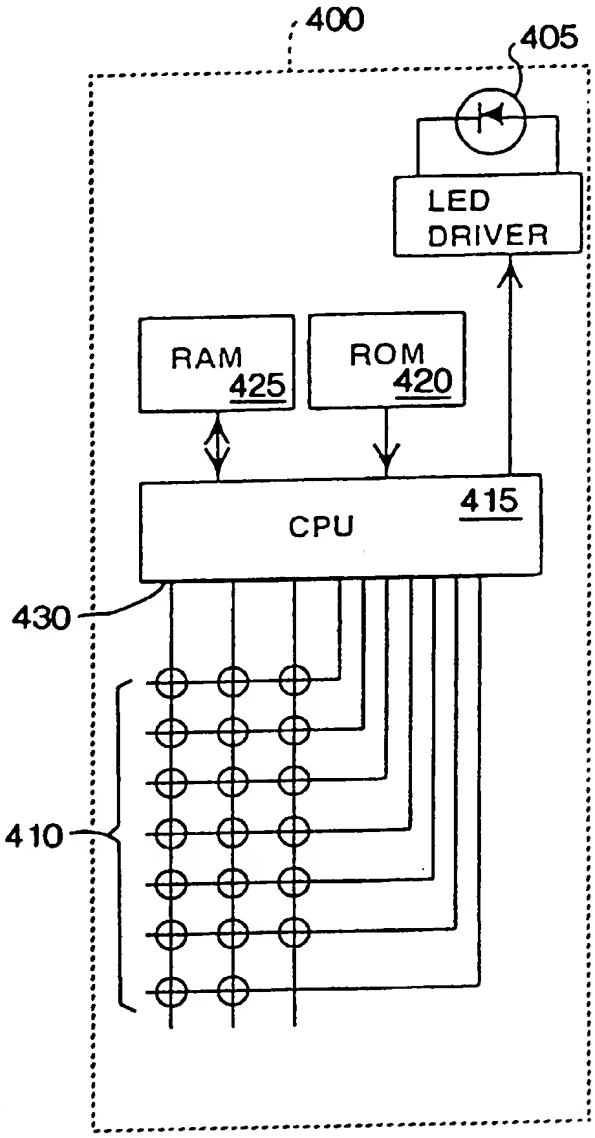

FIG. 5

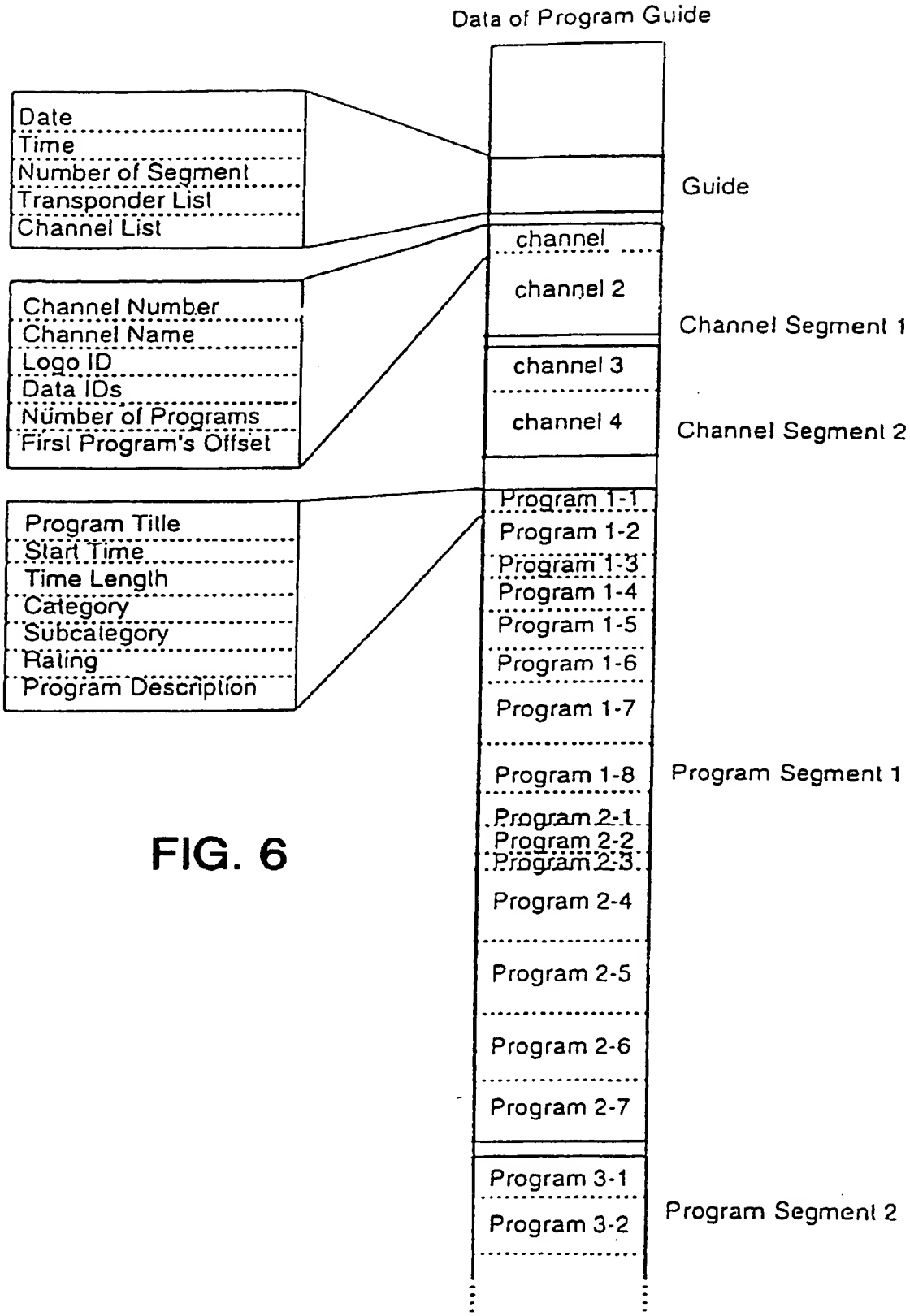
Data of Program Guide
Date
Time
Number of Segment
Transponder List
Channel List
Guide
Channel Number
Channel Name
Logo ID
Data IDs
Number of Programs
First Program's Offset
channel
channel 2
Channel Segment 1
channel 3
channel 4
Channel Segment 2
Program Title
Start Time
Time Length
Category
Subcategory
Rating
Program Description
Program 1-1
Program 1-2
Program 1-3
Program 1-4
Program 1-5
Program 1-6
Program 1-7
Program 1-8
Program Segment 1
Program 2-1
Program 2-2
Program 2-3
Program 2-4
Program 2-5
Program 2-6
Program 2-7
Program 3-1
Program 3-2
Program Segment 2

FIG. 6

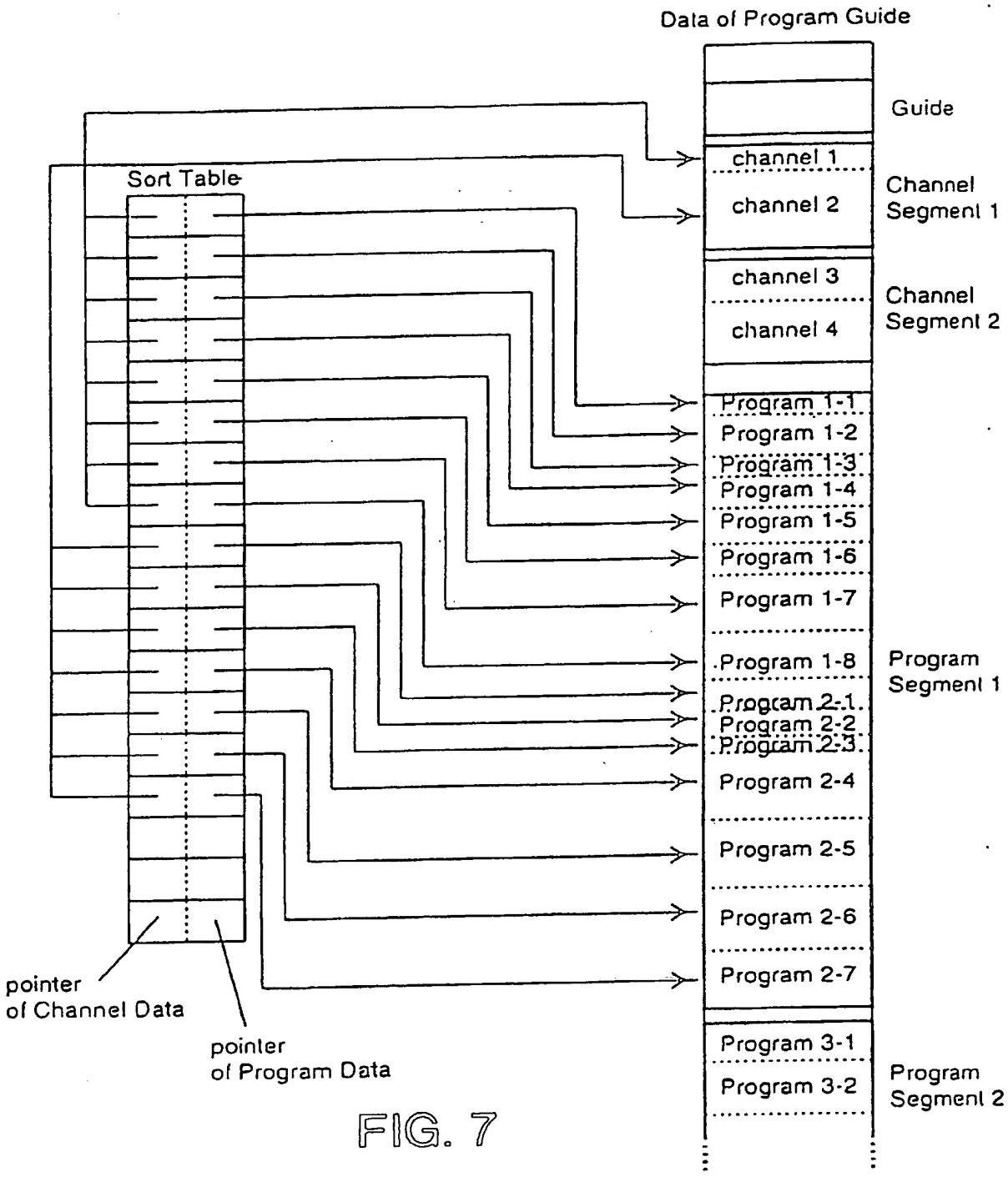
Data of Program Guide
Guide
channel 1
channel 2
Channel Segment 1
channel 3
channel 4
Channel Segment 2
Program 1-1
Program 1-2
Program 1-3
Program 1-4
Program 1-5
Program 1-6
Program 1-7
Program 1-8
Program 2-1
Program 2-2
Program 2-3
Program 2-4
Program 2-5
Program 2-6
Program 2-7
Program Segment 1
Program 3-1
Program 3-2
Program Segment 2
Sort Table
pointer of Channel Data
pointer of Program Data

FIG. 7

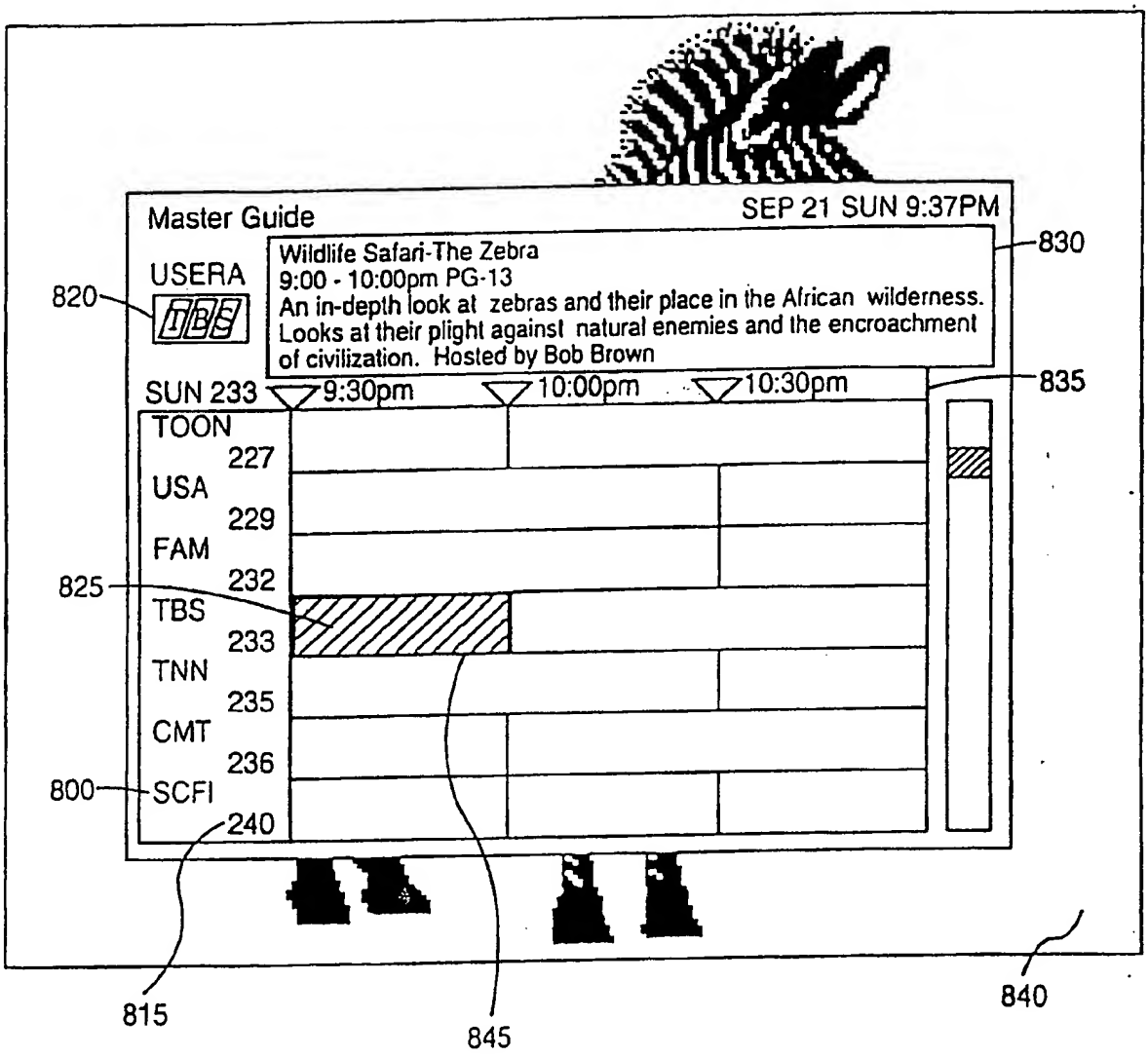
Master Guide
SEP 21 SUN 9:37PM
Wildlife Safari-The Zebra
9:00 - 10:00pm PG-13
An in-depth look at zebras and their place in the African wilderness.
Looks at their plight against natural enemies and the encroachment
of civilization. Hosted by Bob Brown
USERA
SUN 233
9:30pm
10:00pm
10:30pm
TOON 227
USA 229
FAM 232
TBS 233
TNN 235
CMT 236
SCFI 240
820
825
800
830
835
815
845
840

FIG. 8

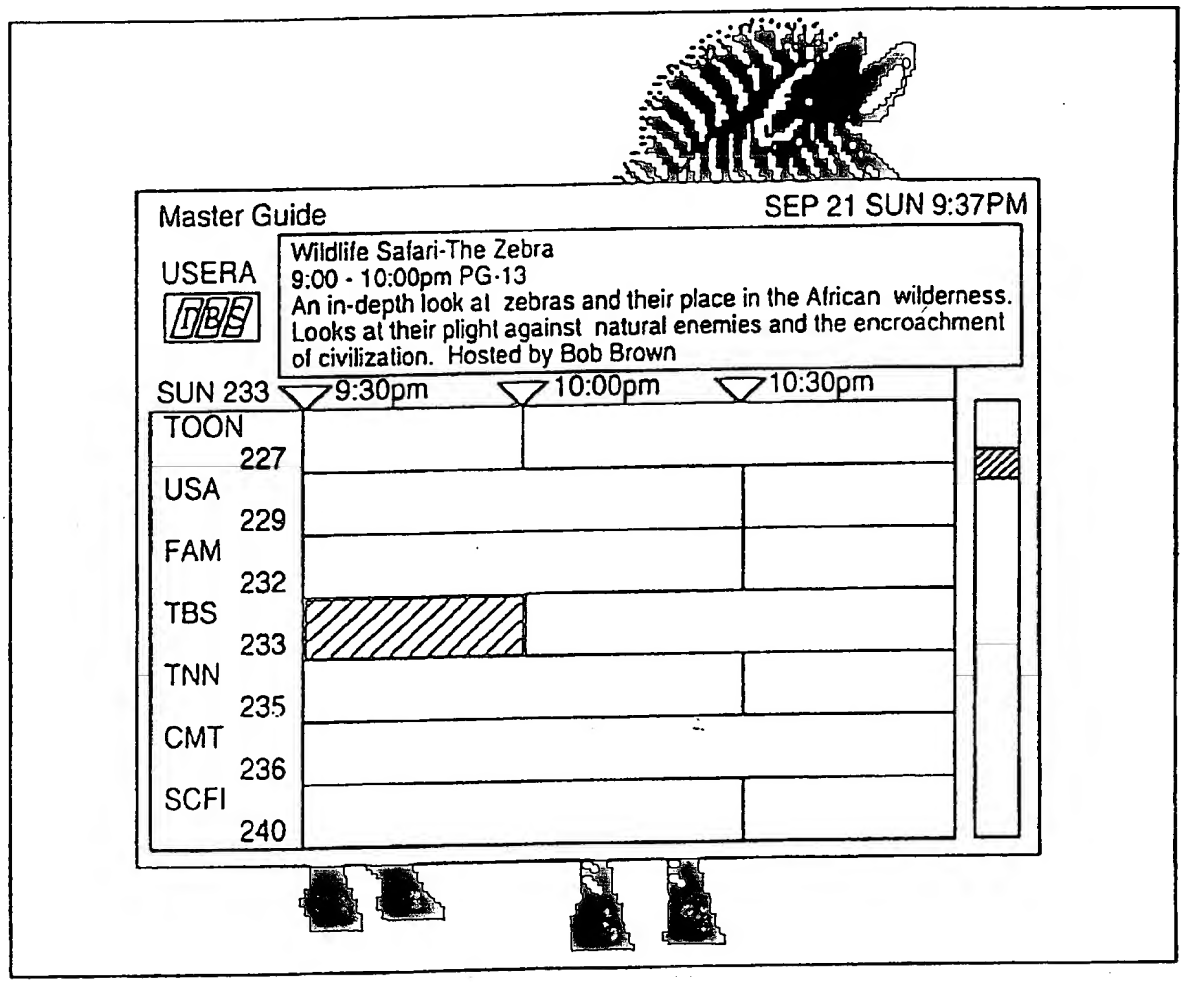
Master Guide
SEP 21 SUN 9:37PM
USERA
Wildlife Safari-The Zebra
9:00 - 10:00pm PG-13
An in-depth look at zebras and their place in the African wilderness. Looks at their plight against natural enemies and the encroachment of civilization. Hosted by Bob Brown
SUN 233
9:30pm
10:00pm
10:30pm
TOON 227
USA 229
FAM 232
TBS 233
TNN 235
CMT 236
SCFI 240

FIG. 9A

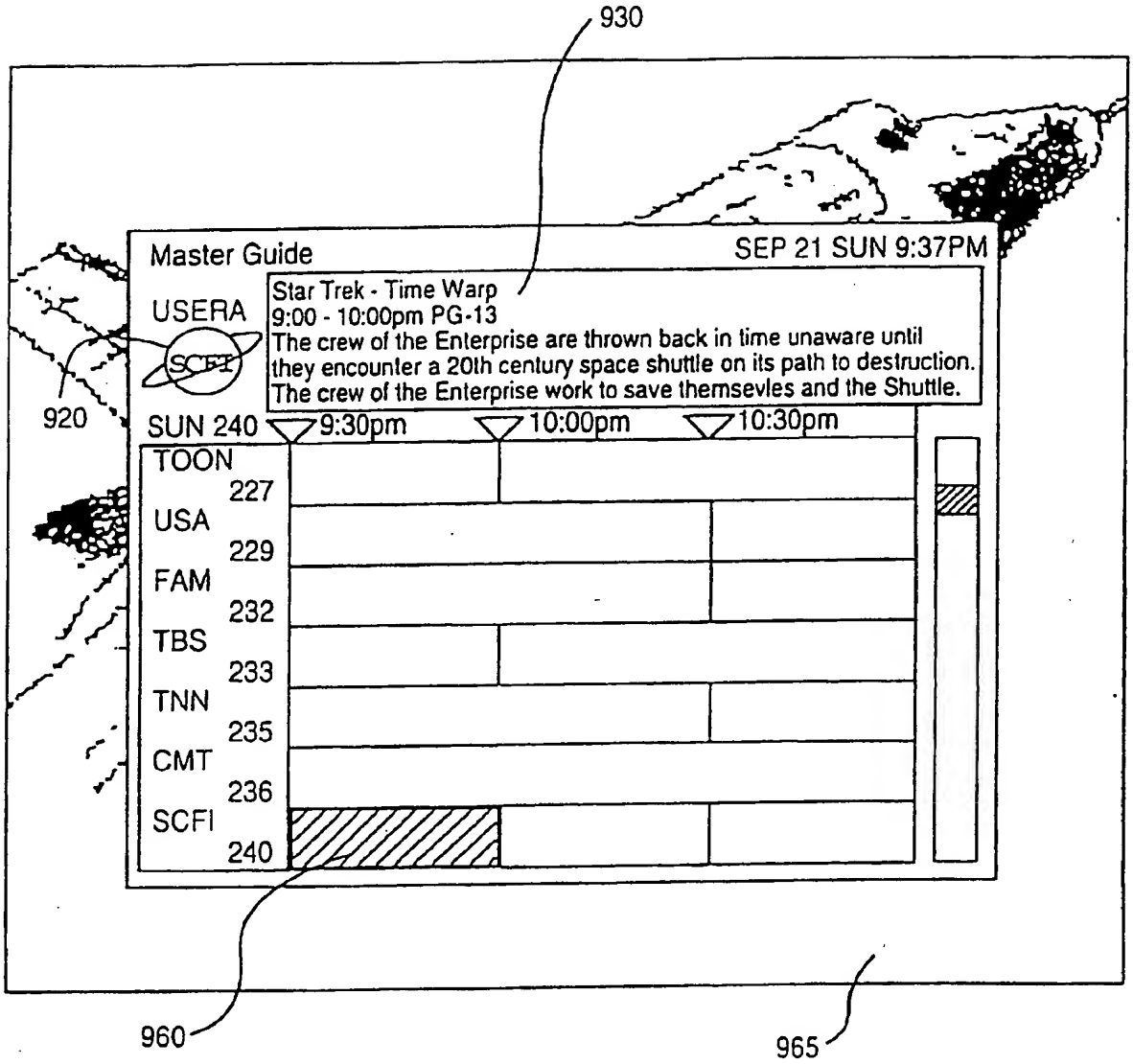
930
Master Guide
SEP 21 SUN 9:37PM
USERA
SCFI
Star Trek - Time Warp
9:00 - 10:00pm PG-13
The crew of the Enterprise are thrown back in time unaware until they encounter a 20th century space shuttle on its path to destruction. The crew of the Enterprise work to save themsevles and the Shuttle.
920
SUN 240
9:30pm
10:00pm
10:30pm
TOON 227
USA 229
FAM 232
TBS 233
TNN 235
CMT 236
SCFI 240
960
965

FIG. 9B

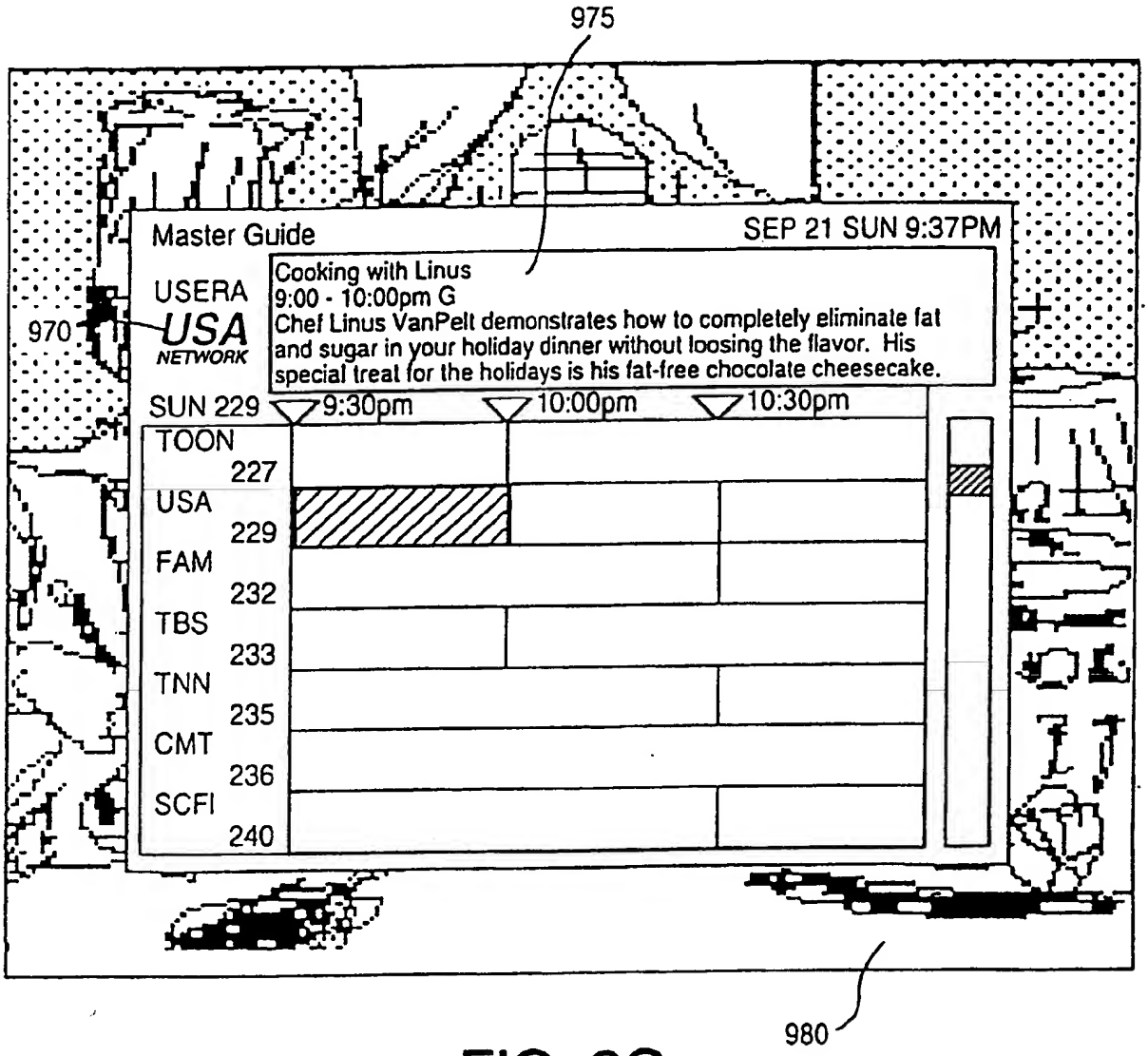
975
Master Guide
SEP 21 SUN 9:37PM
Cooking with Linus
9:00 - 10:00pm G
Chef Linus VanPelt demonstrates how to completely eliminate fat and sugar in your holiday dinner without loosing the flavor. His special treat for the holidays is his fat-free chocolate cheesecake.
USERA
USA NETWORK
970
SUN 229
9:30pm
10:00pm
10:30pm
TOON 227
USA 229
FAM 232
TBS 233
TNN 235
CMT 236
SCFI 240
980

FIG. 9C

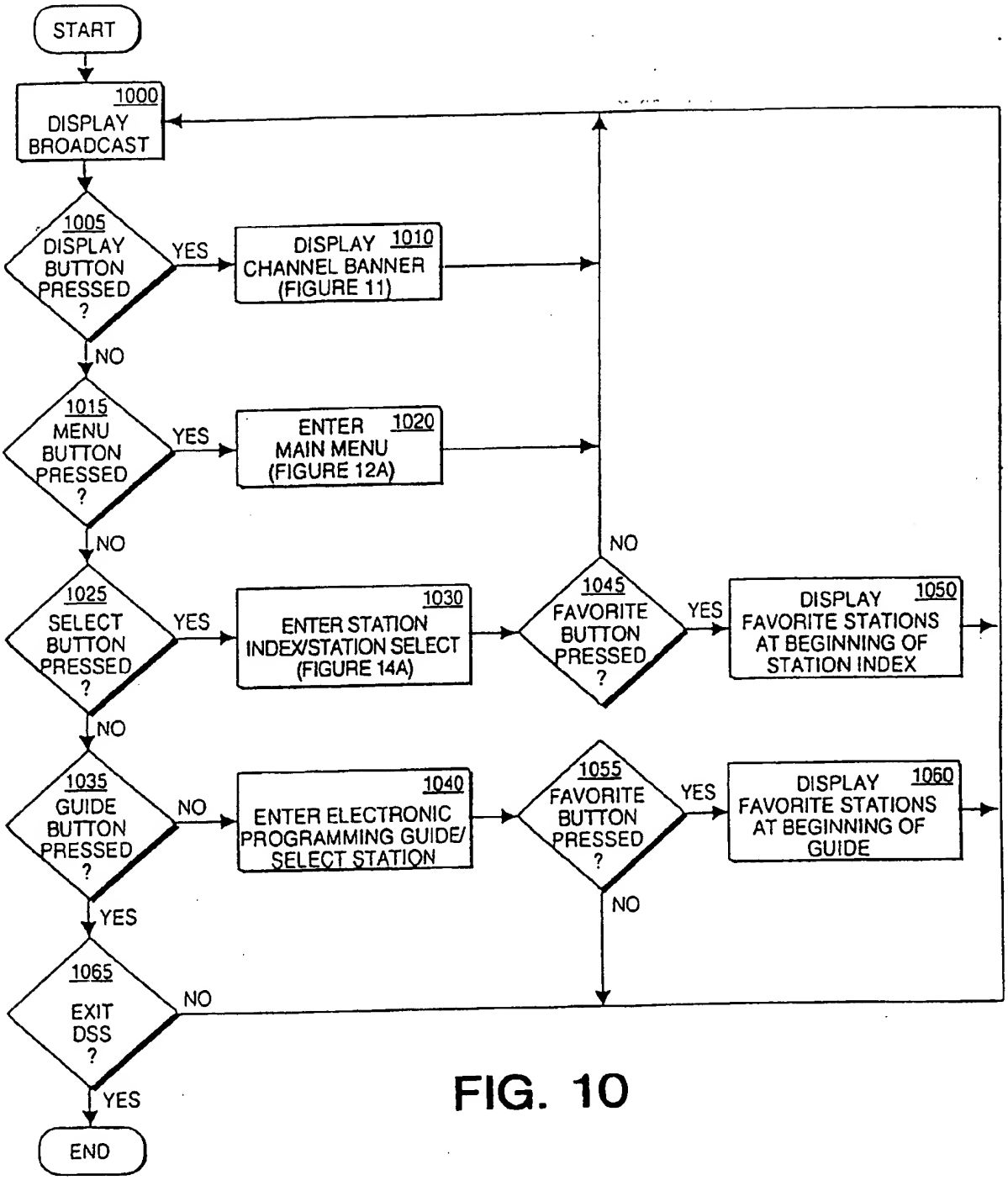
START
1000
DISPLAY BROADCAST
1005
DISPLAY BUTTON PRESSED ?
YES
DISPLAY 1010 CHANNEL BANNER (FIGURE 11)
NO
1015
MENU BUTTON PRESSED ?
YES
ENTER 1020 MAIN MENU (FIGURE 12A)
NO
1025
SELECT BUTTON PRESSED ?
YES
1030
ENTER STATION INDEX/STATION SELECT (FIGURE 14A)
NO
1035
GUIDE BUTTON PRESSED ?
NO
1040
ENTER ELECTRONIC PROGRAMMING GUIDE/ SELECT STATION
YES
1065
EXIT DSS ?
NO
YES
END
NO
1045
FAVORITE BUTTON PRESSED ?
YES
DISPLAY 1050 FAVORITE STATIONS AT BEGINNING OF STATION INDEX
1055
FAVORITE BUTTON PRESSED ?
YES
DISPLAY 1060 FAVORITE STATIONS AT BEGINNING OF GUIDE
NO

FIG. 10

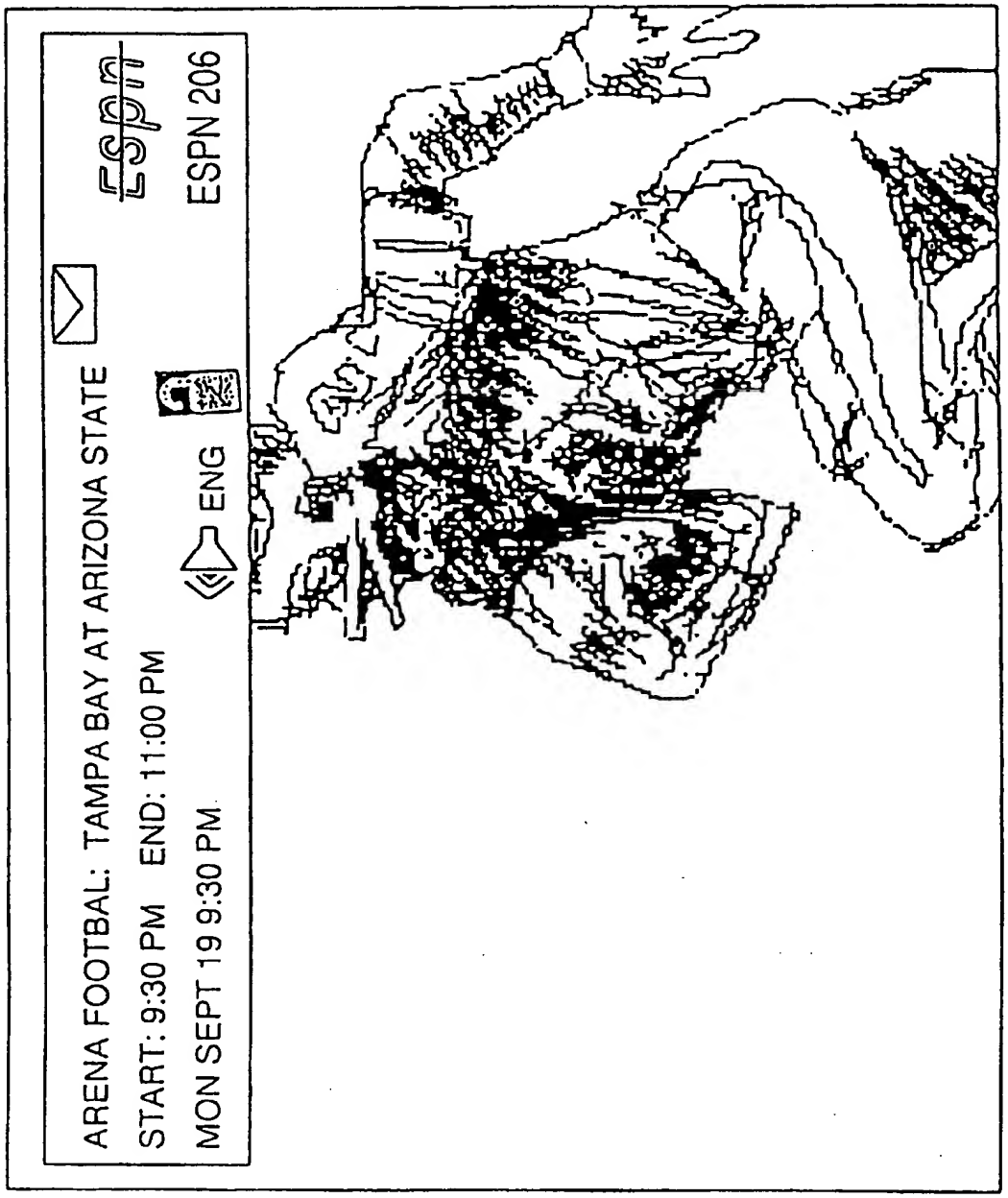
ARENA FOOTBAL: TAMPA BAY AT ARIZONA STATE
START: 9:30 PM END: 11:00 PM
MON SEPT 19 9:30 PM
ENG
ESPN
ESPN 206

FIG. 11

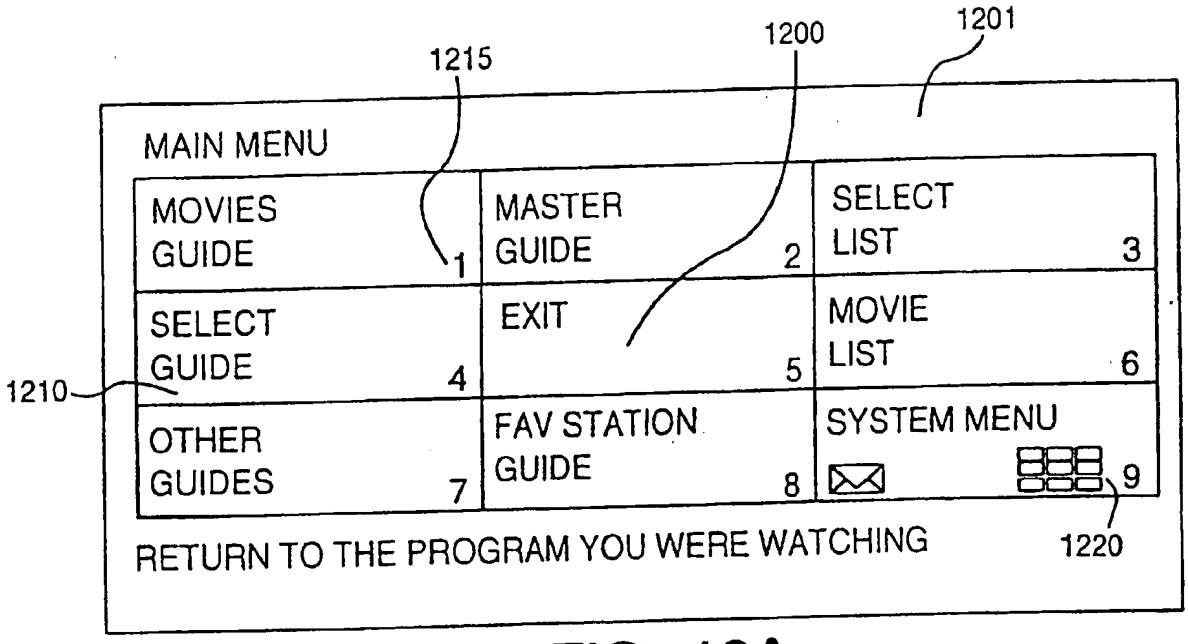

FIG. 12A

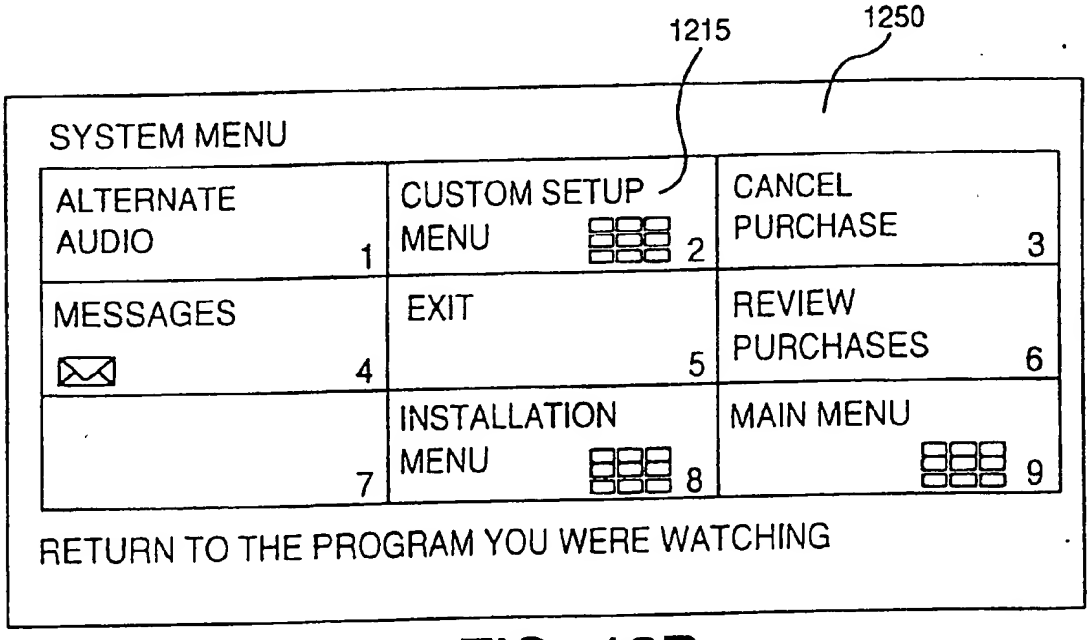

FIG. 12B

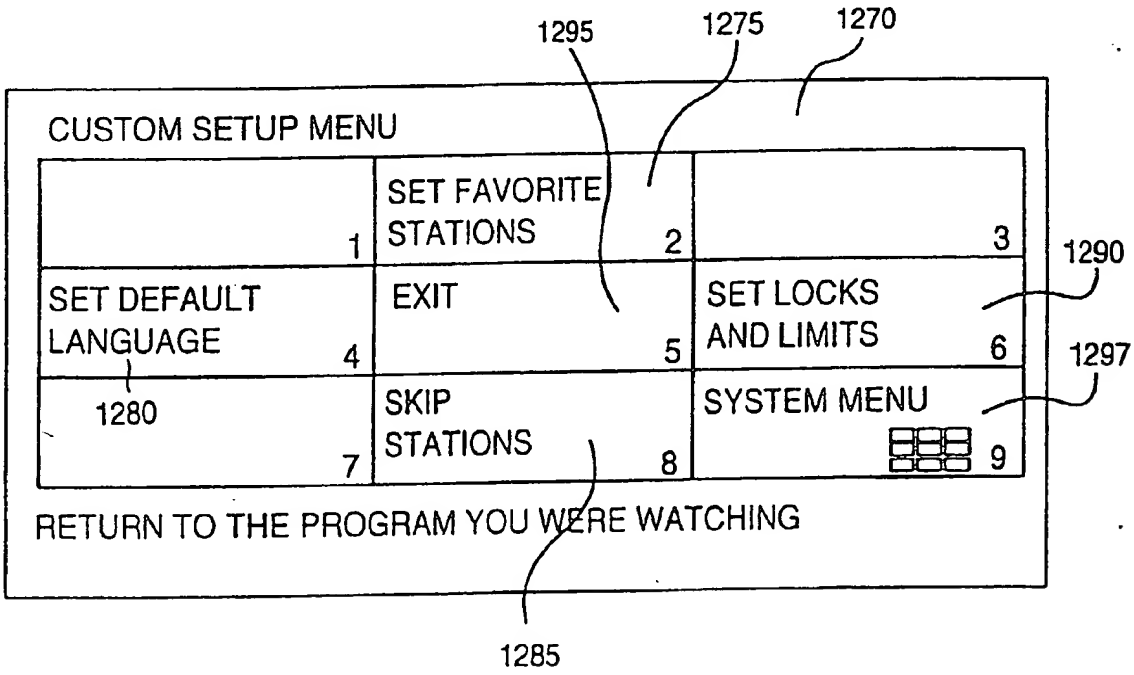
1295
1275
1270
CUSTOM SETUP MENU
1
SET FAVORITE STATIONS
2
3
1290
SET DEFAULT LANGUAGE
4
EXIT
5
SET LOCKS AND LIMITS
6
1297
1280
SKIP STATIONS
7
8
SYSTEM MENU
9
RETURN TO THE PROGRAM YOU WERE WATCHING
1285

FIG. 12C

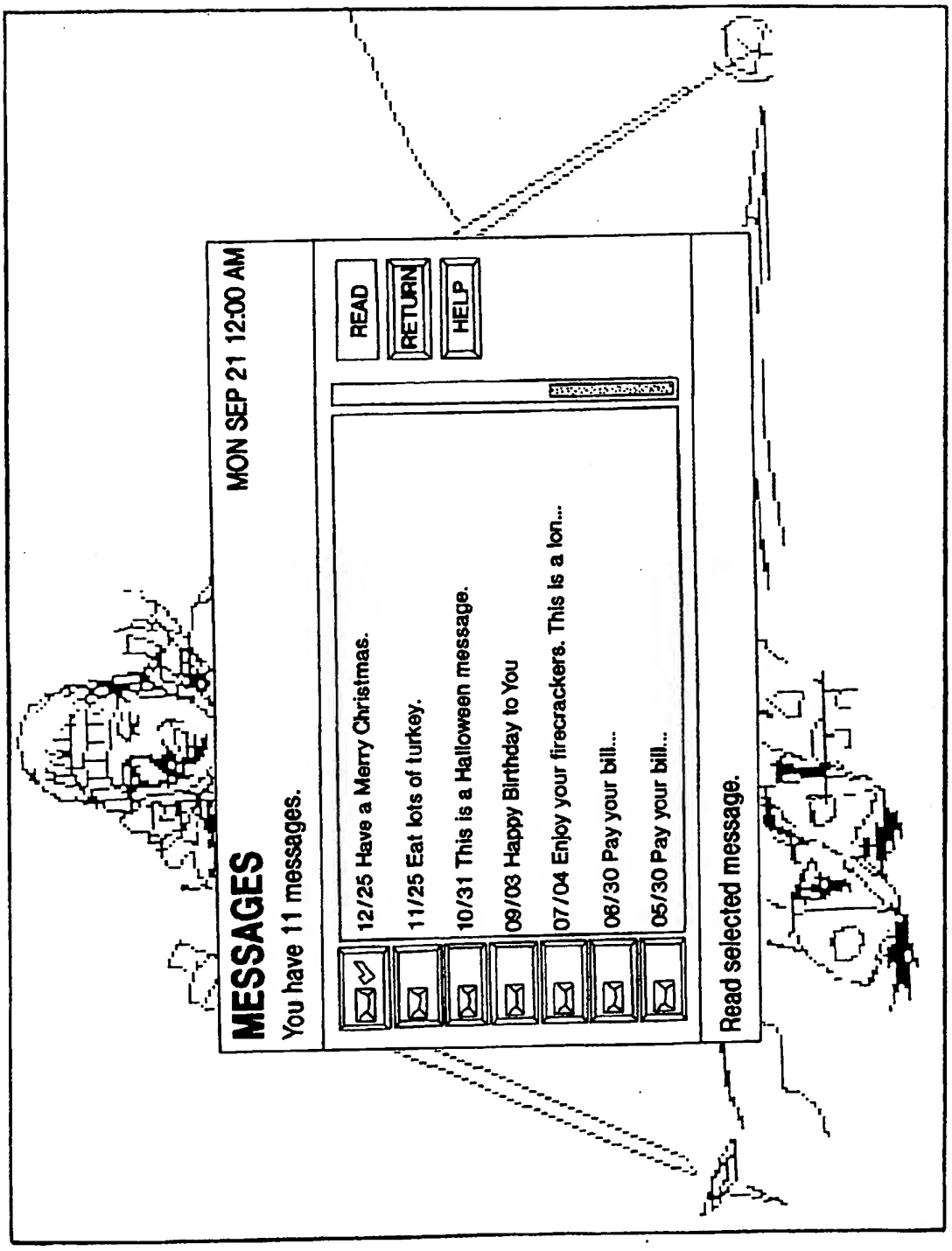
MESSAGES
MON SEP 21 12:00 AM
You have 11 messages.
READ
RETURN
HELP
12/25 Have a Merry Christmas.
11/25 Eat lots of turkey.
10/31 This is a Halloween message.
09/03 Happy Birthday to You
07/04 Enjoy your firecrackers. This is a lon...
06/30 Pay your bill...
05/30 Pay your bill...
Read selected message.

FIG. 12D

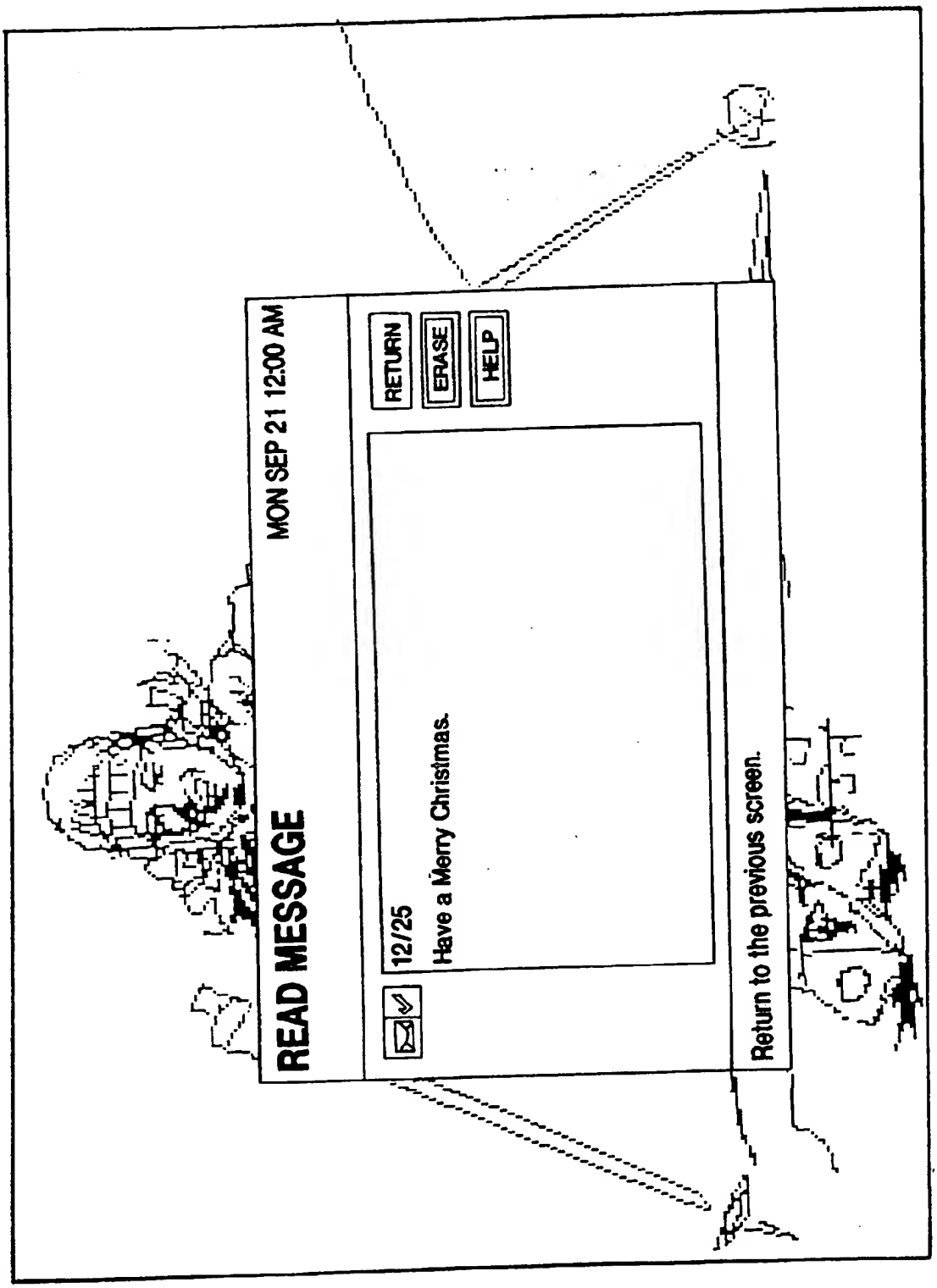
READ MESSAGE
MON SEP 21 12:00 AM
RETURN
ERASE
HELP
12/25
Have a Merry Christmas.
Return to the previous screen.

FIG. 12E

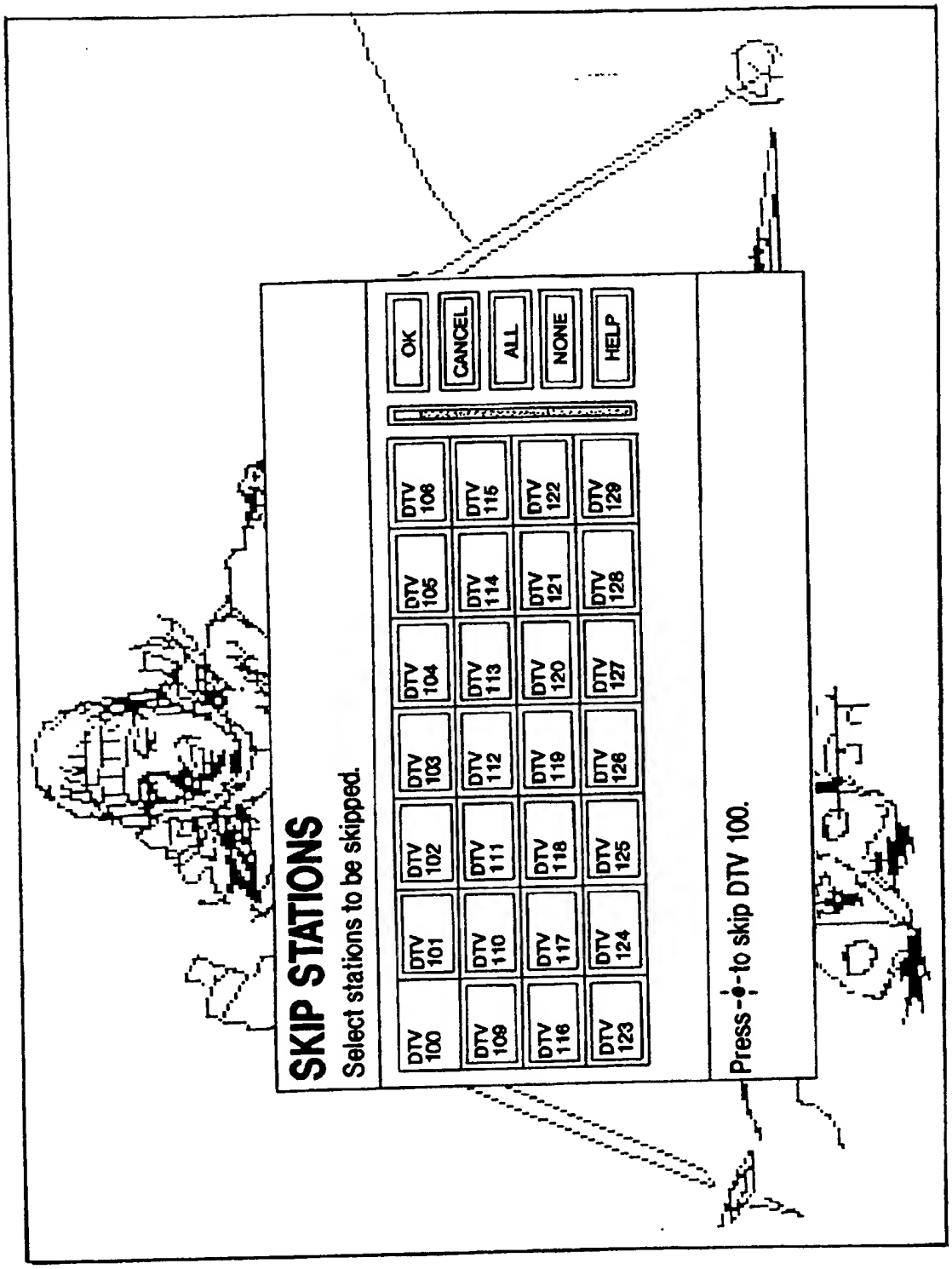
SKIP STATIONS
Select stations to be skipped.
DTV 100
DTV 101
DTV 102
DTV 103
DTV 104
DTV 105
DTV 106
DTV 107
DTV 108
DTV 109
DTV 110
DTV 111
DTV 112
DTV 113
DTV 114
DTV 115
DTV 116
DTV 117
DTV 118
DTV 119
DTV 120
DTV 121
DTV 122
DTV 123
DTV 124
DTV 125
DTV 126
DTV 127
DTV 128
DTV 129
OK
CANCEL
ALL
NONE
HELP
Press ↓ to skip DTV 100.

FIG. 12F

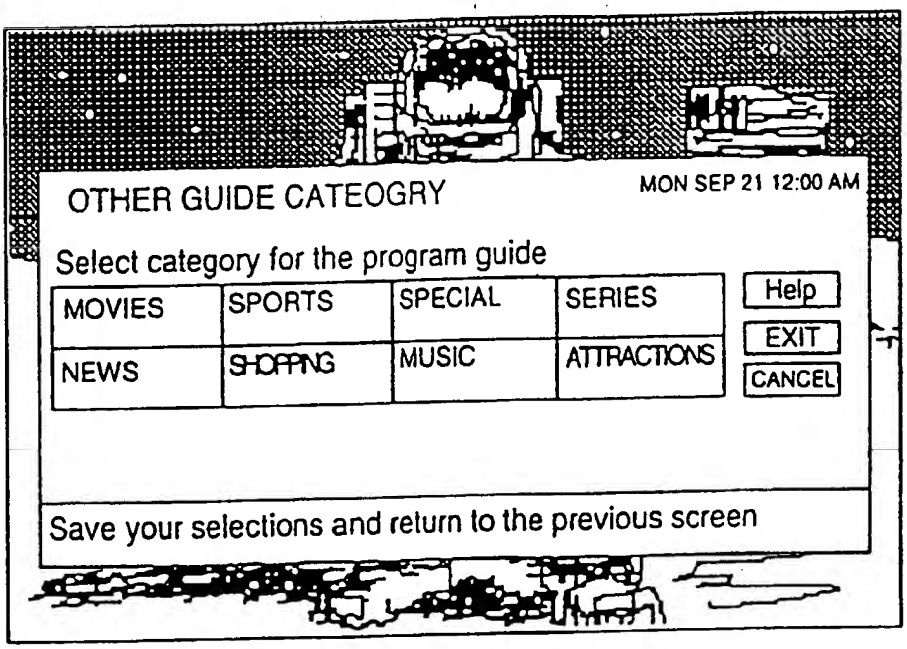

FIG. 13A

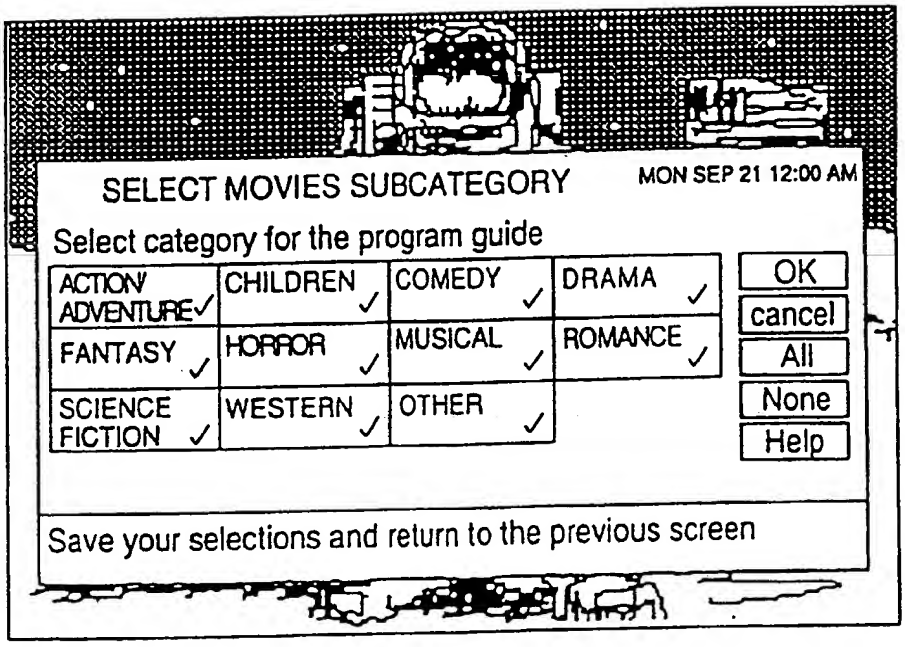

FIG. 13B

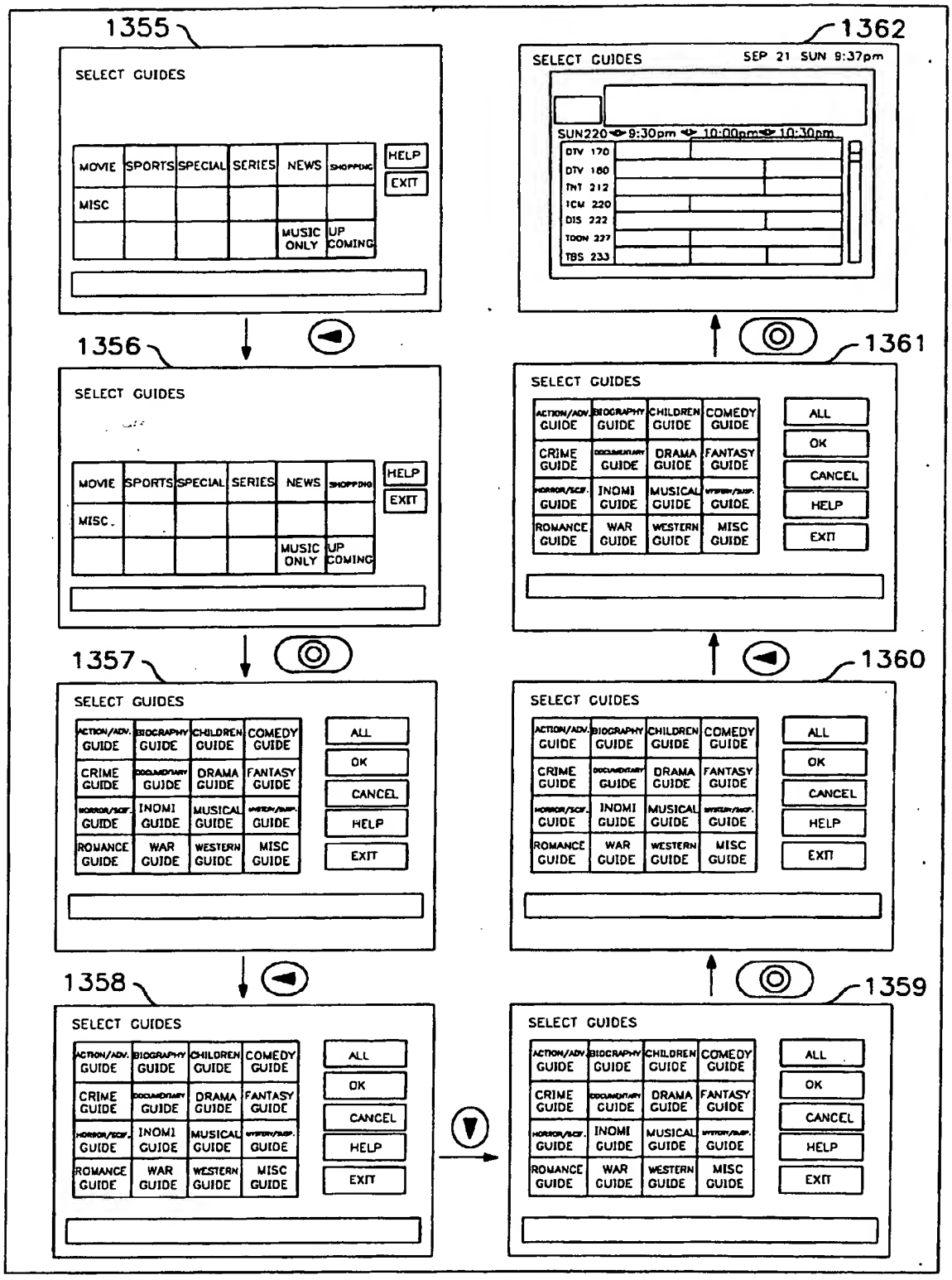
1355
SELECT GUIDES
MOVIE
SPORTS
SPECIAL
SERIES
NEWS
SHOPPING
HELP
EXIT
MISC
MUSIC ONLY
UP COMING
1362
SELECT GUIDES
SEP 21 SUN 9:37pm
SUN220
9:30pm
10:00pm
10:30pm
DTV 170
DTV 180
TNT 212
TCM 220
DIS 222
TOON 227
TBS 233
1356
SELECT GUIDES
1361
SELECT GUIDES
ACTION/ADV. GUIDE
BIOGRAPHY GUIDE
CHILDREN GUIDE
COMEDY GUIDE
CRIME GUIDE
DOCUMENTARY GUIDE
DRAMA GUIDE
FANTASY GUIDE
HORROR/SCIF. GUIDE
INOMI GUIDE
MUSICAL GUIDE
MYSTERY/SUSP. GUIDE
ROMANCE GUIDE
WAR GUIDE
WESTERN GUIDE
MISC GUIDE
ALL
OK
CANCEL
HELP
EXIT
1357
1360
1358
1359

FIG. 13C

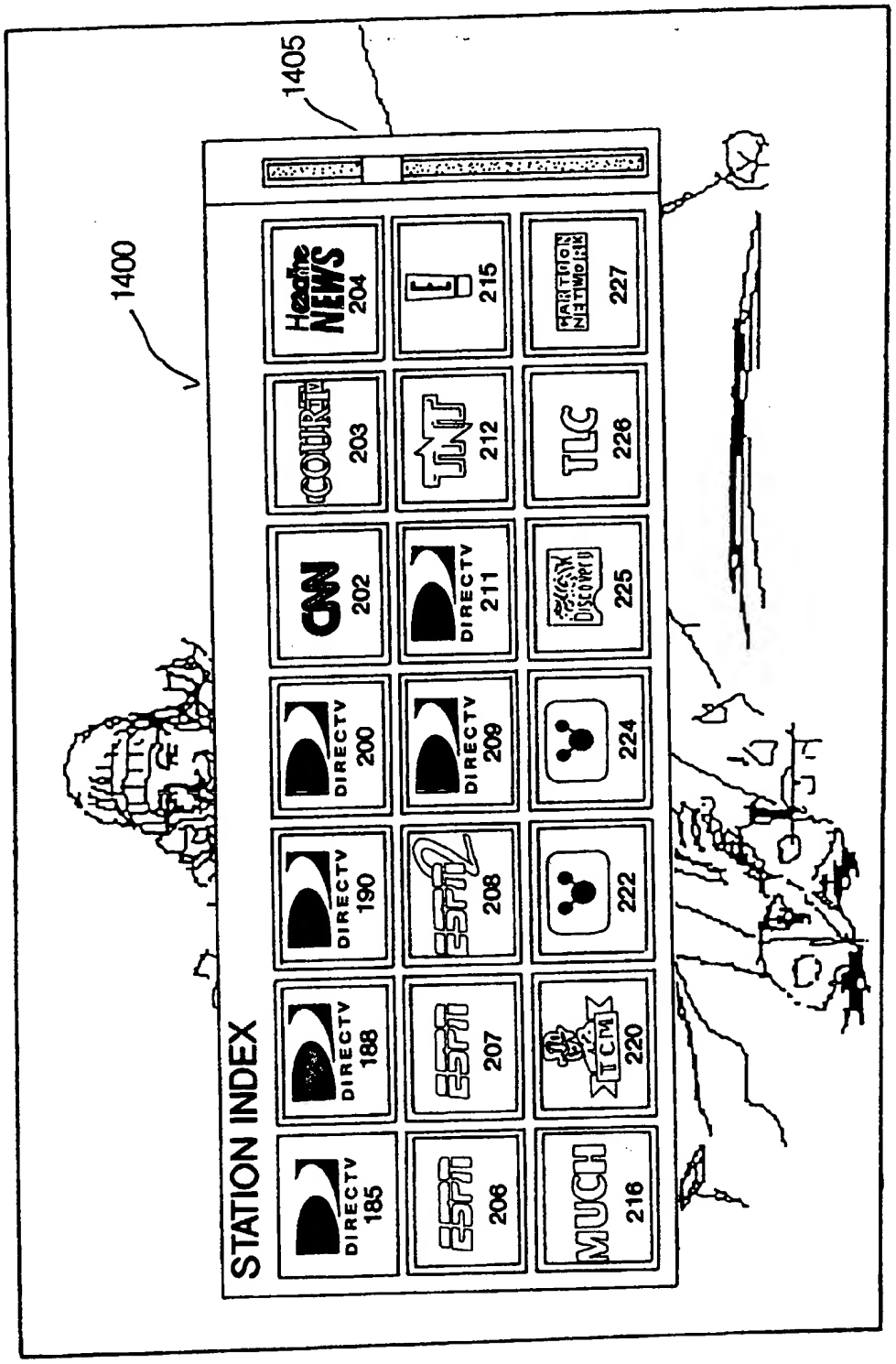
1400
1405
STATION INDEX
DIRECTV 185
DIRECTV 188
DIRECTV 190
DIRECTV 200
CNN 202
COURT TV 203
Headline NEWS 204
ESPN 206
ESPN 207
ESPN2 208
DIRECTV 209
DIRECTV 211
TNT 212
E! 215
MUCH 216
TCM 220
222
224
DISCOVERY 225
TLC 226
MARTHON NETWORK 227

FIG. 14A

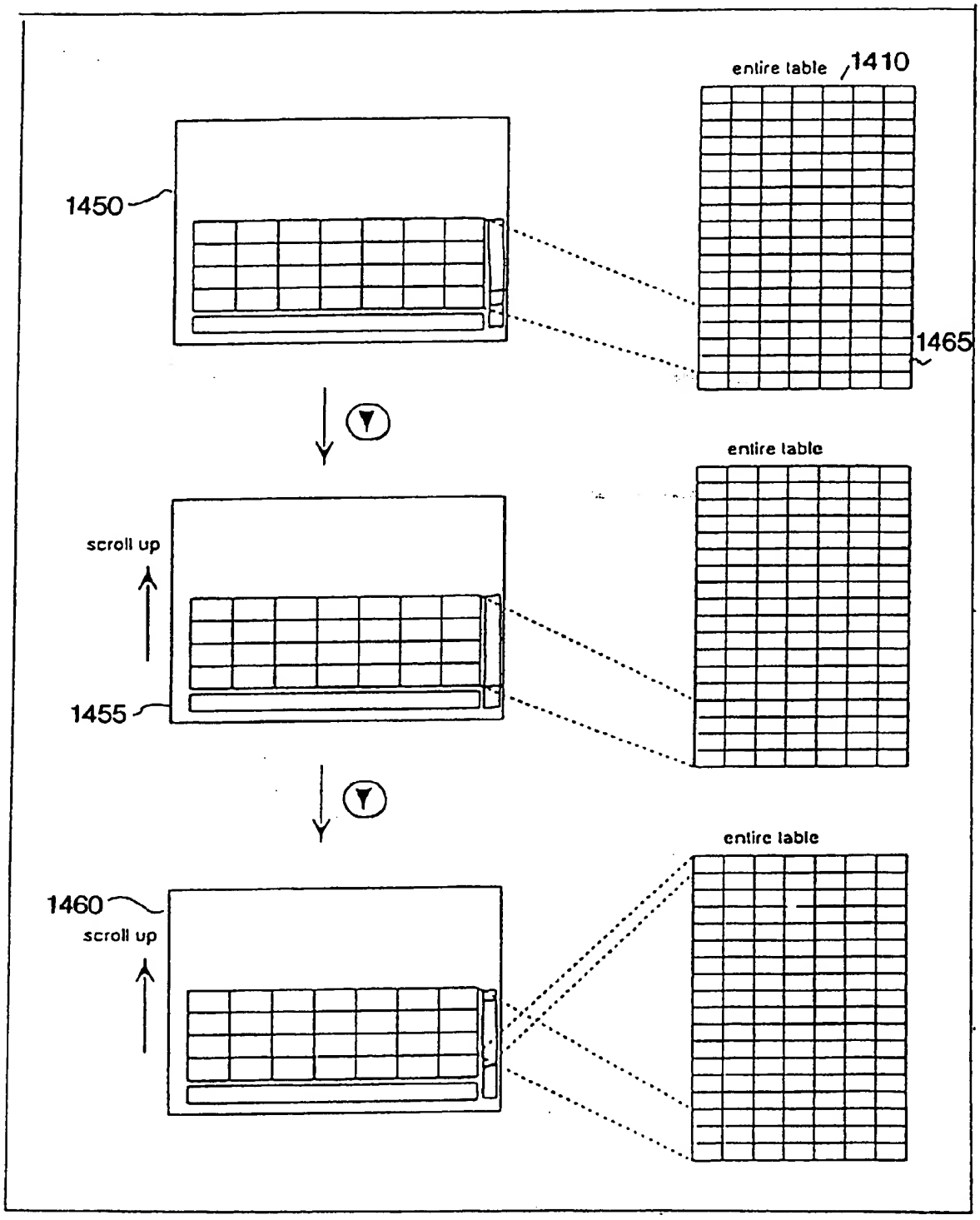
entire table
1410
1450
1465
entire table
scroll up
1455
entire table
1460
scroll up

FIG. 14B

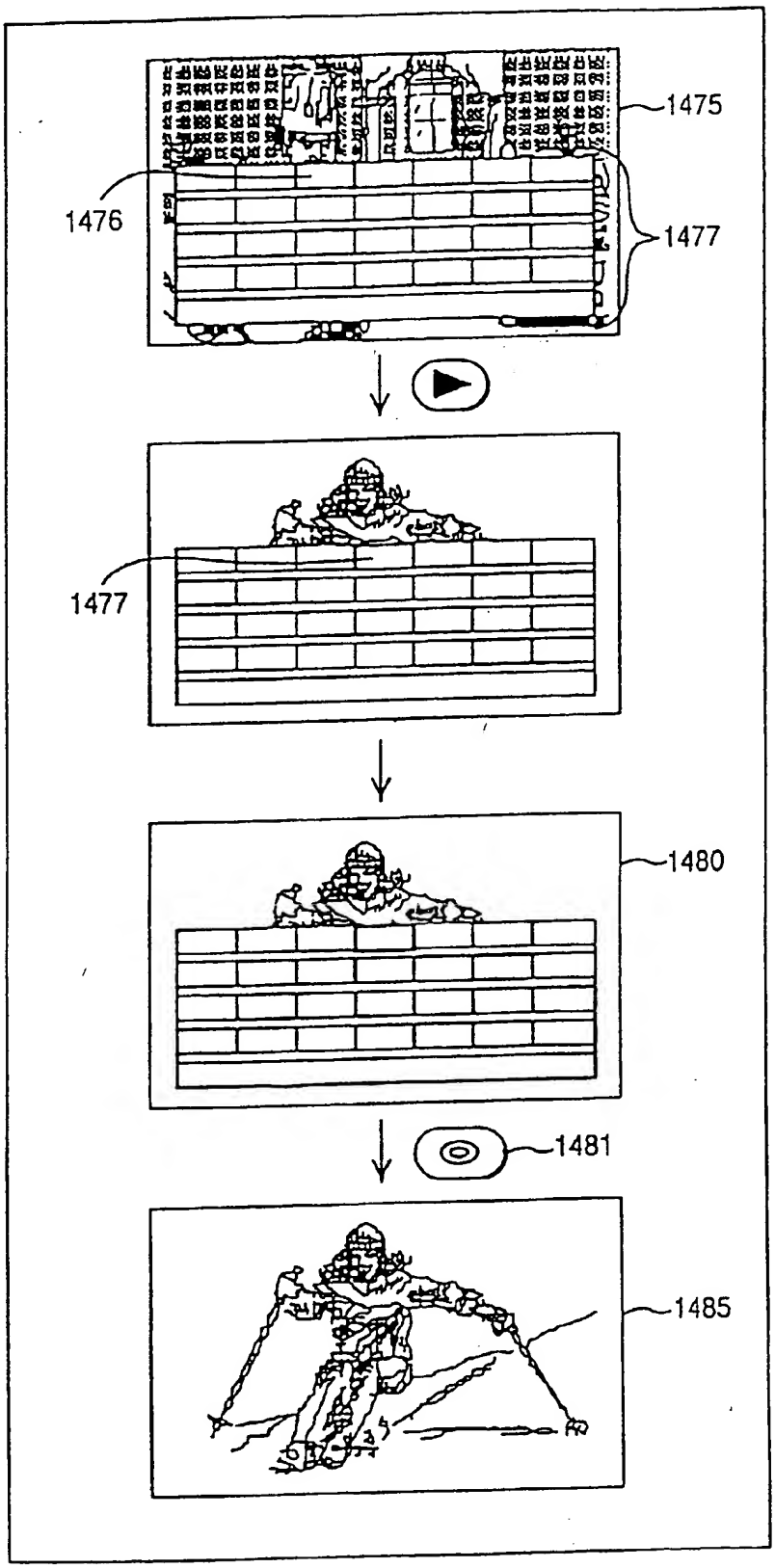

FIG. 14C

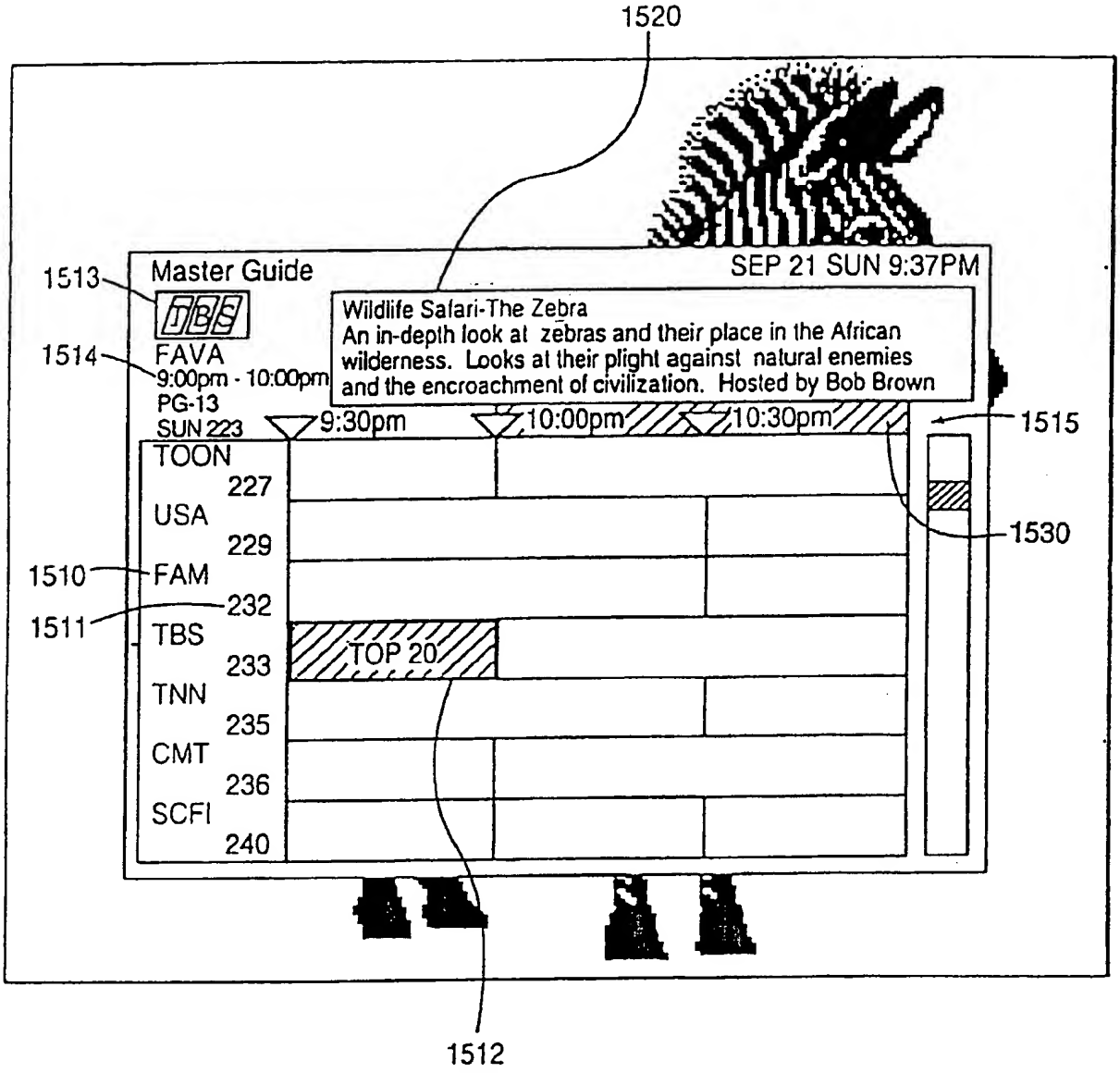
1520
Master Guide
SEP 21 SUN 9:37PM
1513
TBS
1514
FAVA
9:00pm - 10:00pm
PG-13
SUN 223
Wildlife Safari-The Zebra
An in-depth look at zebras and their place in the African wilderness. Looks at their plight against natural enemies and the encroachment of civilization. Hosted by Bob Brown
9:30pm
10:00pm
10:30pm
1515
TOON
227
USA
229
1530
1510
FAM
232
1511
TBS
233
TOP 20
TNN
235
CMT
236
SCFI
240
1512

FIG. 15

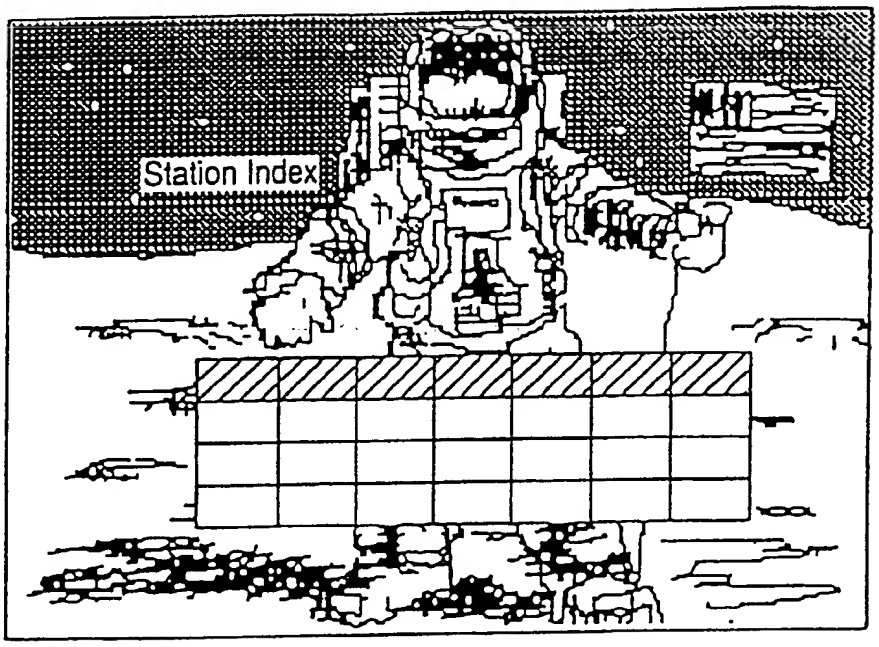

FIG. 16A

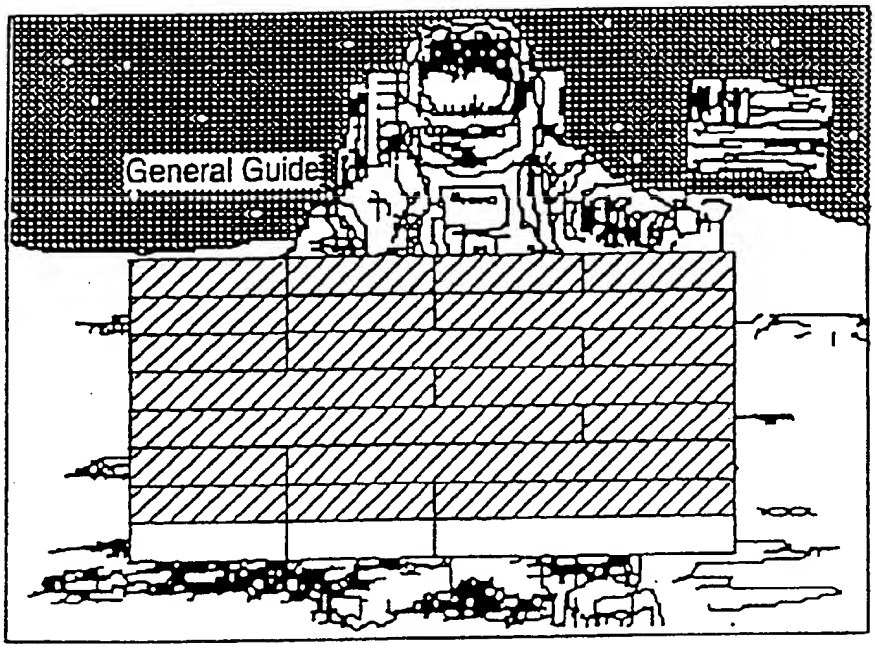

FIG. 16B

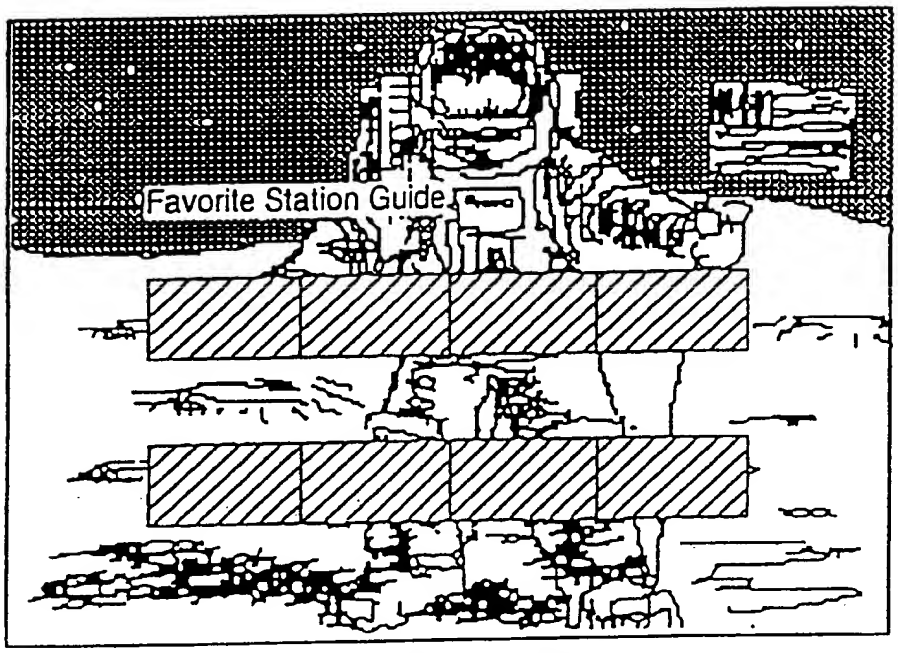

FIG. 16C

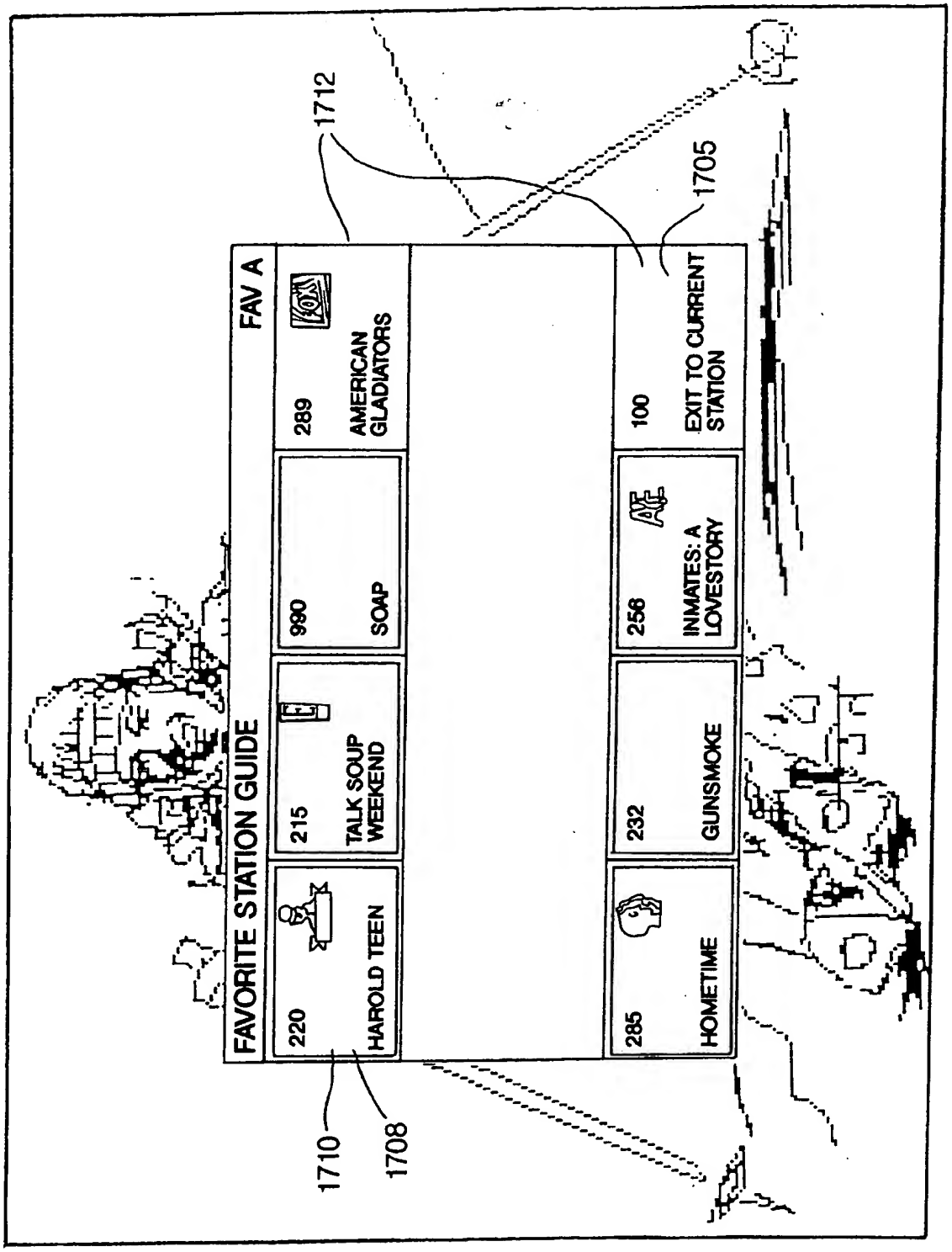
FAVORITE STATION GUIDE
FAV A
220
HAROLD TEEN
215
TALK SOUP WEEKEND
990
SOAP
289
AMERICAN GLADIATORS
285
HOMETIME
232
GUNSMOKE
256
INMATES: A LOVESTORY
100
EXIT TO CURRENT STATION
1710
1708
1712
1705

FIG. 17

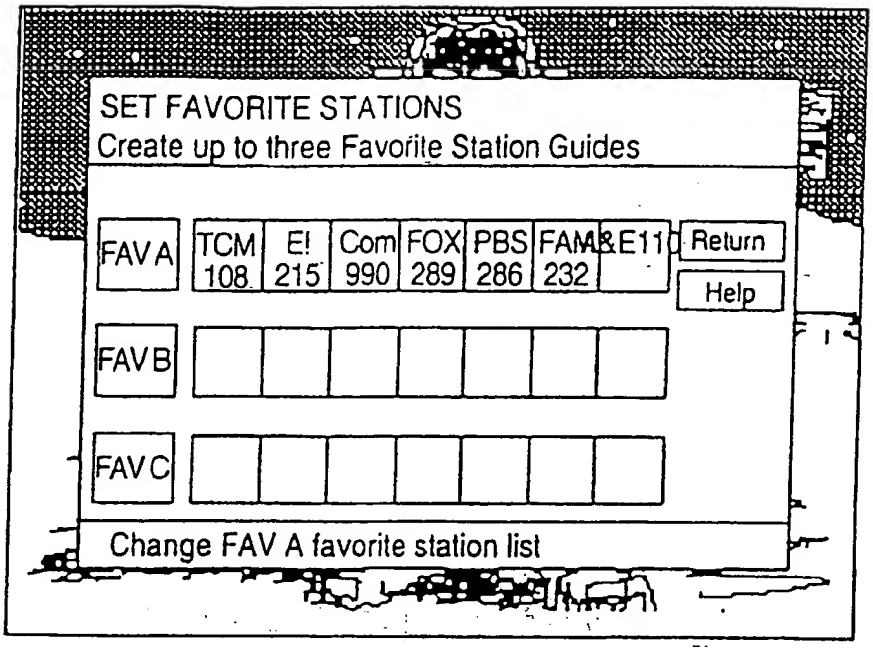

FIG. 18A

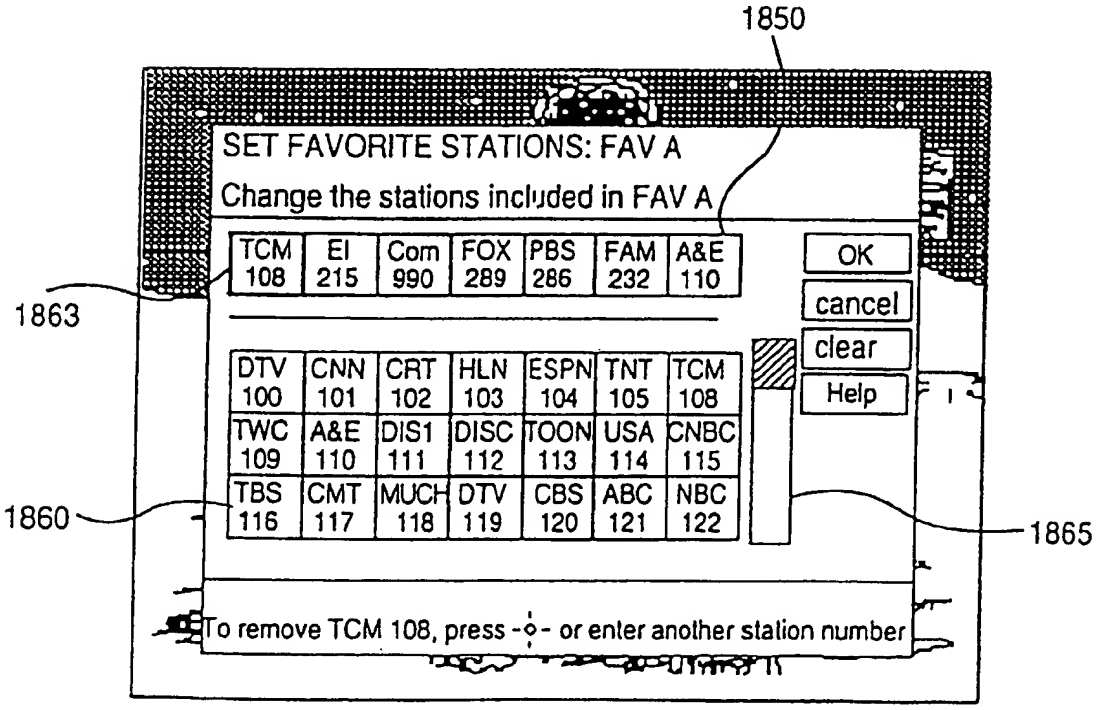

FIG. 18B

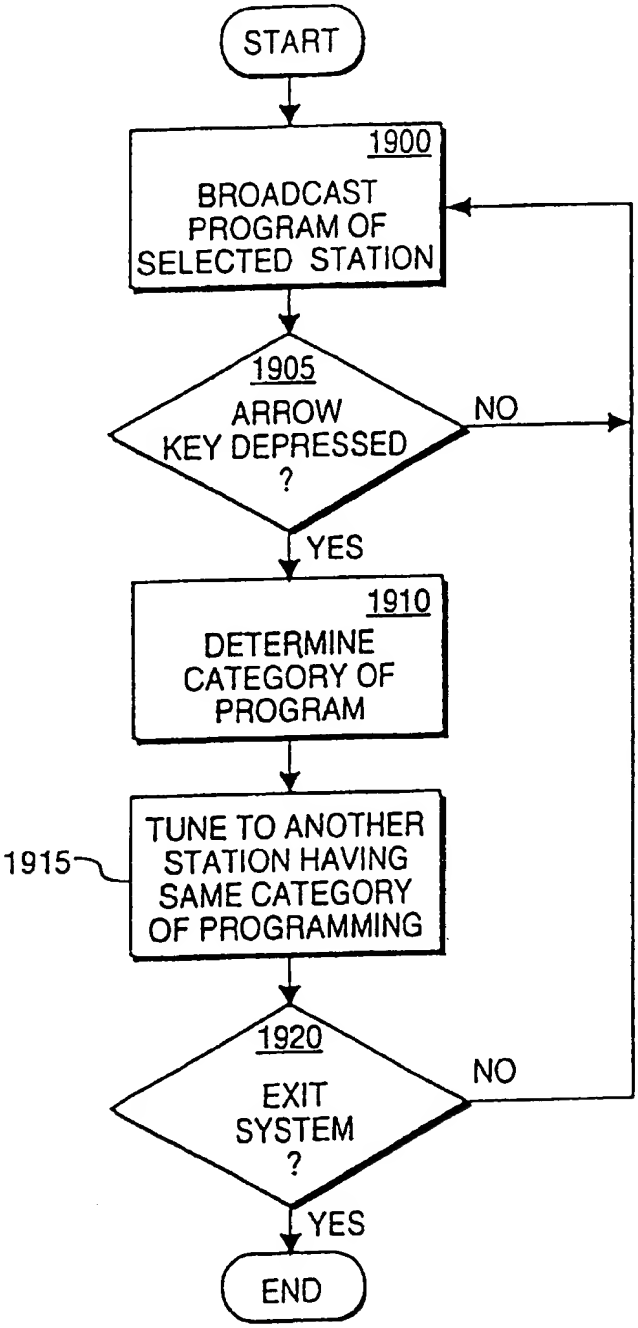
START
1900
BROADCAST PROGRAM OF SELECTED STATION
1905
ARROW KEY DEPRESSED ?
NO
YES
1910
DETERMINE CATEGORY OF PROGRAM
1915
TUNE TO ANOTHER STATION HAVING SAME CATEGORY OF PROGRAMMING
1920
EXIT SYSTEM ?
NO
YES
END

FIG. 19

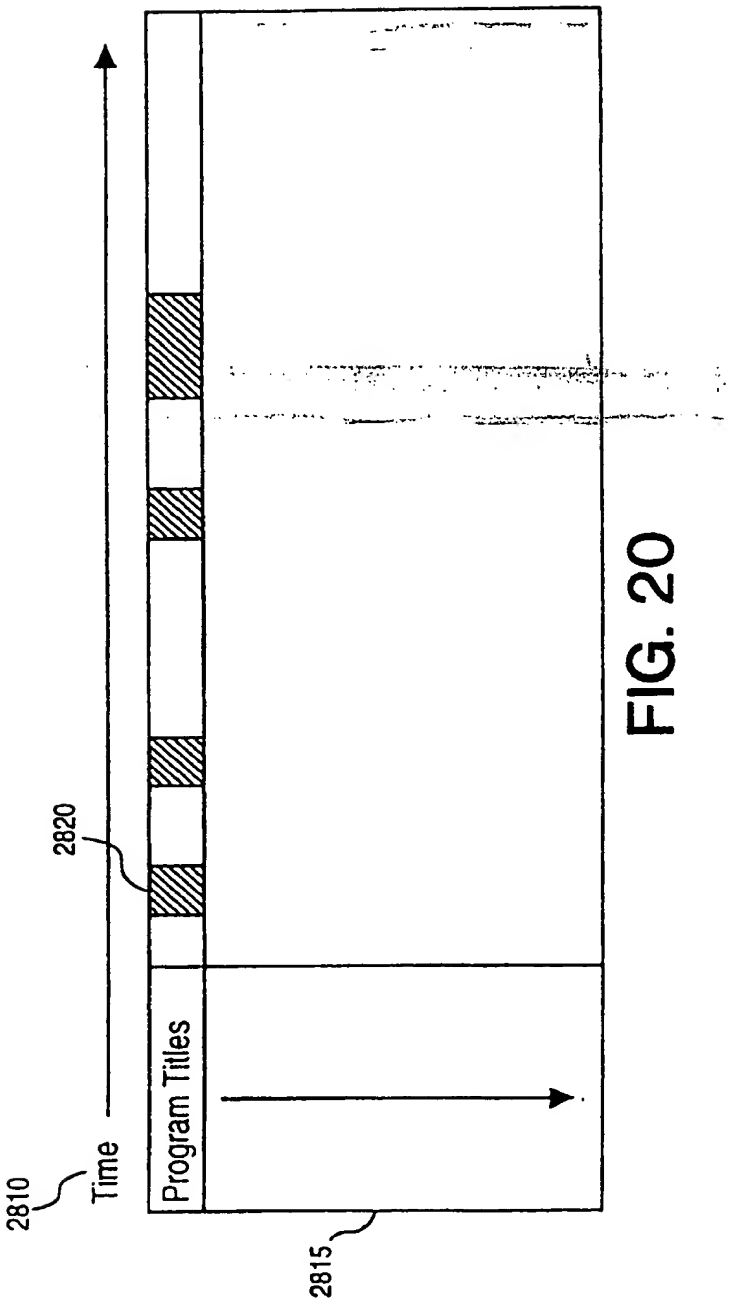

FIG. 20

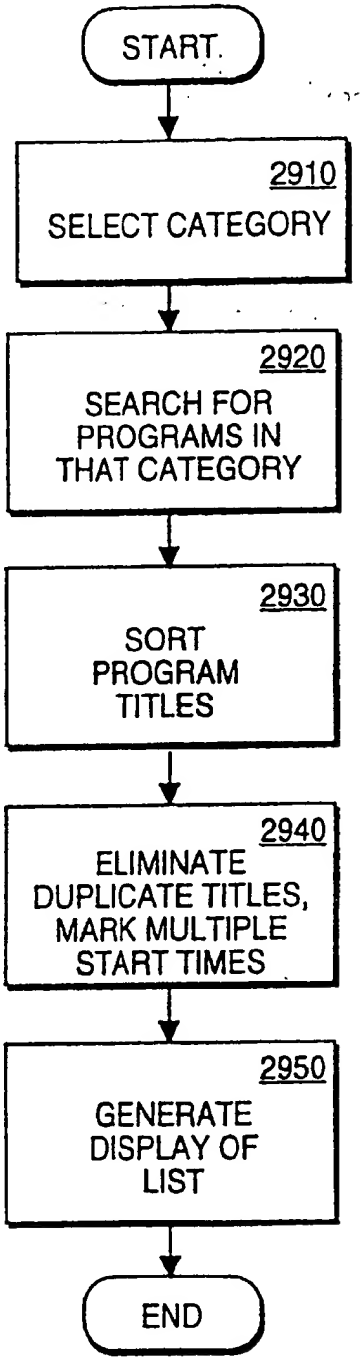
START.
2910
SELECT CATEGORY
2920
SEARCH FOR PROGRAMS IN THAT CATEGORY
2930
SORT PROGRAM TITLES
2940
ELIMINATE DUPLICATE TITLES, MARK MULTIPLE START TIMES
2950
GENERATE DISPLAY OF LIST
END

FIG. 21

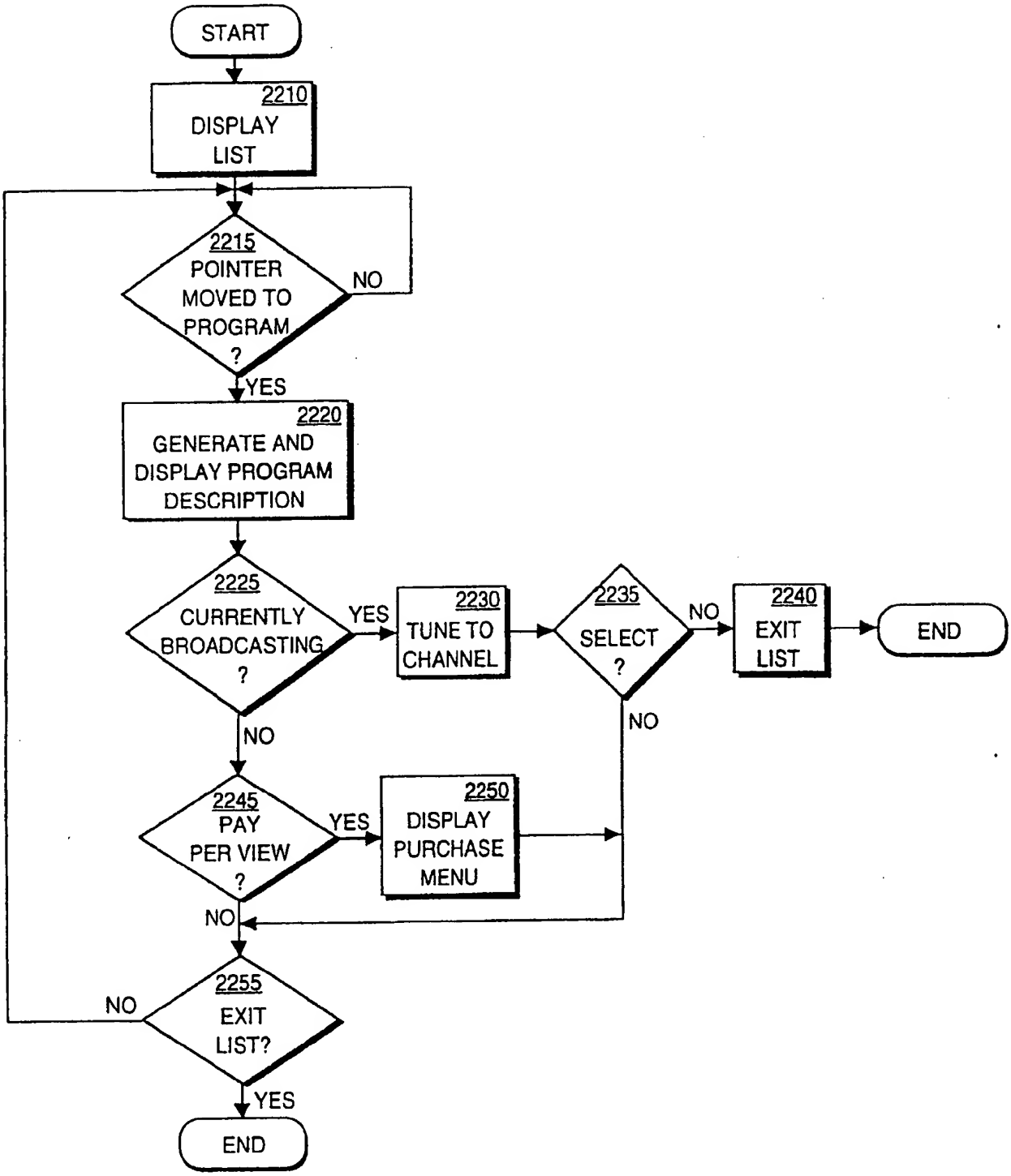
START
2210
DISPLAY LIST
2215
POINTER MOVED TO PROGRAM ?
NO
YES
2220
GENERATE AND DISPLAY PROGRAM DESCRIPTION
2225
CURRENTLY BROADCASTING ?
YES
2230
TUNE TO CHANNEL
2235
SELECT ?
NO
2240
EXIT LIST
END
NO
NO
2245
PAY PER VIEW ?
YES
2250
DISPLAY PURCHASE MENU
NO
2255
EXIT LIST?
NO
YES
END

FIG. 22

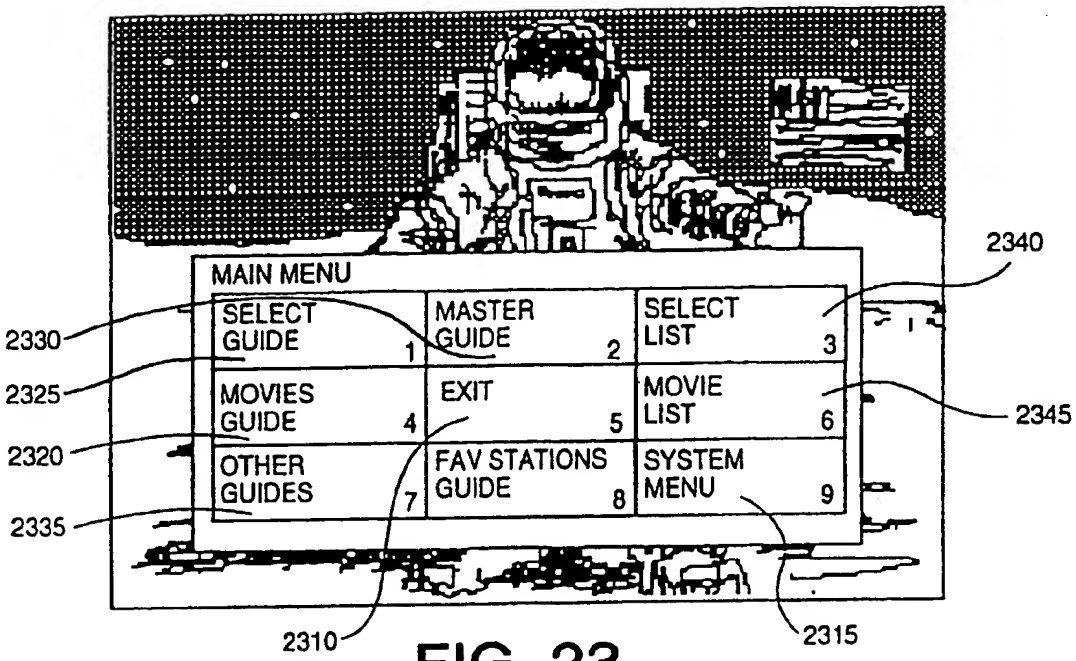
MAIN MENU
SELECT GUIDE 1
MASTER GUIDE 2
SELECT LIST 3
MOVIES GUIDE 4
EXIT 5
MOVIE LIST 6
OTHER GUIDES 7
FAV STATIONS GUIDE 8
SYSTEM MENU 9
2330
2325
2320
2335
2340
2345
2310
2315

FIG. 23

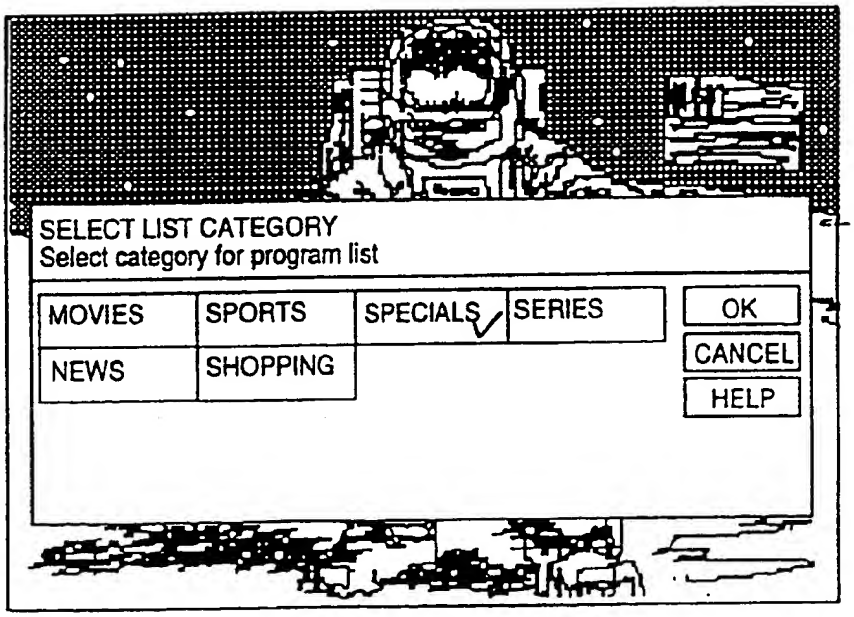
SELECT LIST CATEGORY
Select category for program list
MOVIES
SPORTS
SPECIALS
SERIES
NEWS
SHOPPING
OK
CANCEL
HELP

FIG. 24

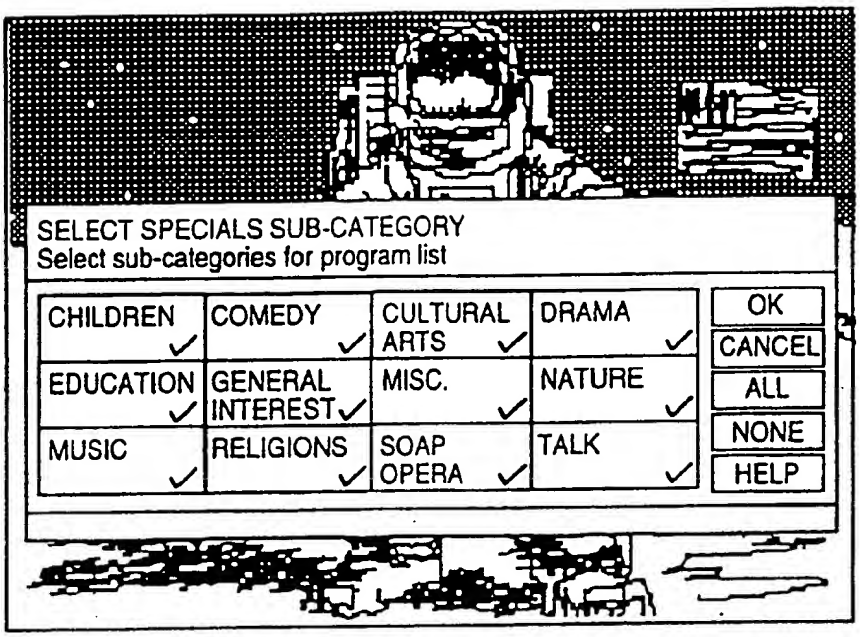
SELECT SPECIALS SUB-CATEGORY
Select sub-categories for program list
CHILDREN
COMEDY
CULTURAL ARTS
DRAMA
EDUCATION
GENERAL INTEREST
MISC.
NATURE
MUSIC
RELIGIONS
SOAP OPERA
TALK
OK
CANCEL
ALL
NONE
HELP

FIG. 25

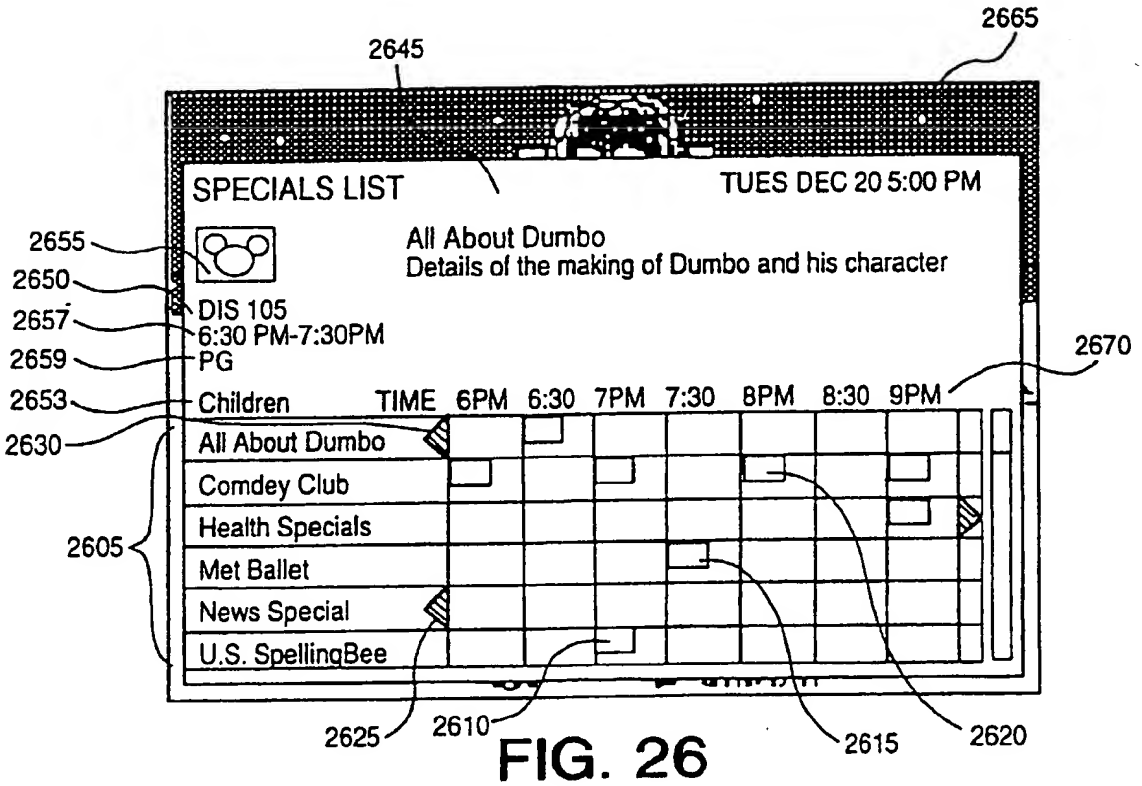
2665
2645
SPECIALS LIST
TUES DEC 20 5:00 PM
2655
All About Dumbo
Details of the making of Dumbo and his character
2650
DIS 105
2657
6:30 PM-7:30PM
2659
PG
2670
2653
Children
TIME 6PM 6:30 7PM 7:30 8PM 8:30 9PM
2630
All About Dumbo
Comdey Club
Health Specials
2605
Met Ballet
News Special
U.S. SpellingBee
2625
2610
2615
2620

FIG. 26

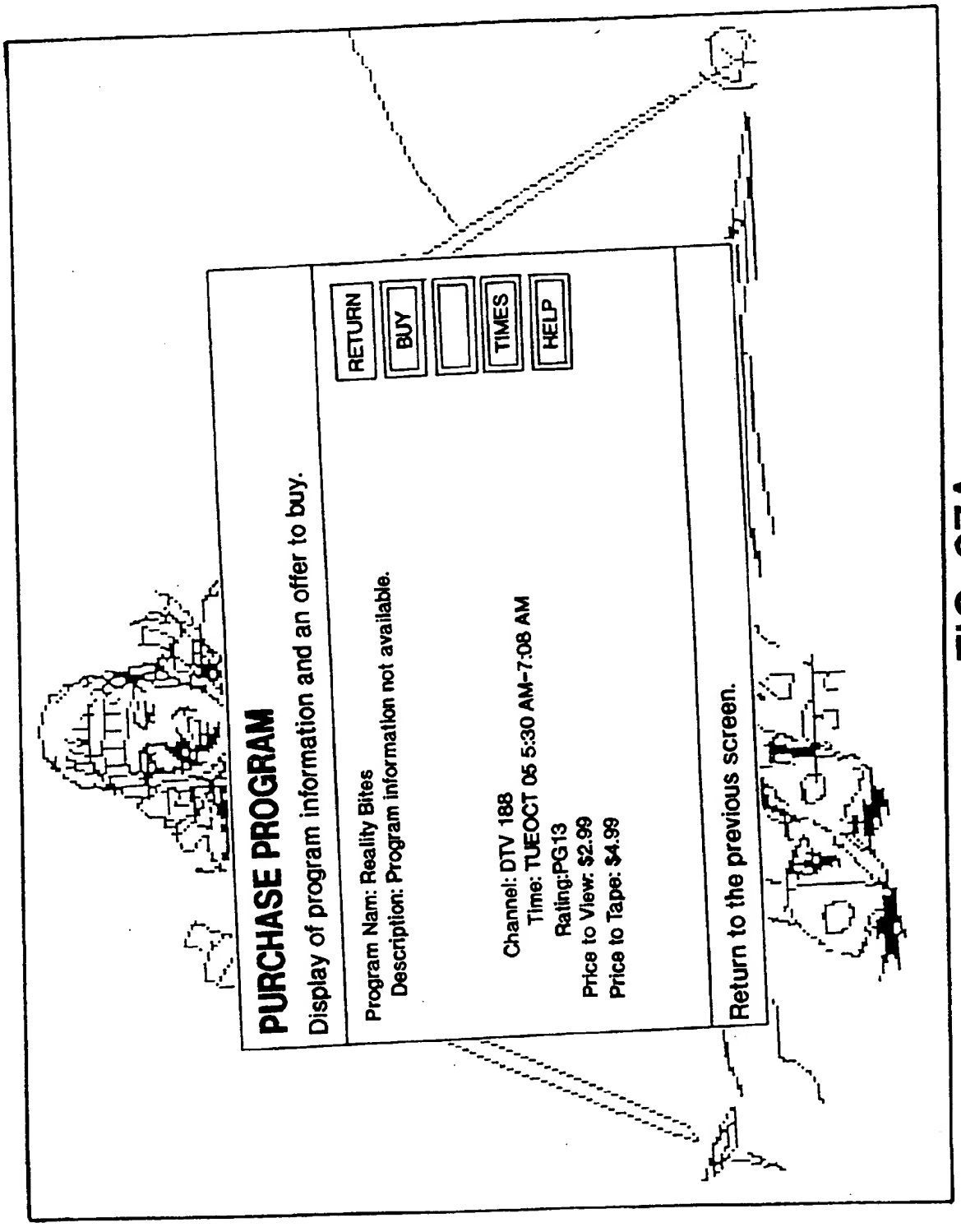
PURCHASE PROGRAM
Display of program information and an offer to buy.
Program Nam: Reality Bites
Description: Program information not available.
Channel: DTV 188
Time: TUEOCT 05 5:30 AM-7:08 AM
Rating:PG13
Price to View: $2.99
Price to Tape: $4.99
RETURN
BUY
TIMES
HELP
Return to the previous screen.

FIG. 27A

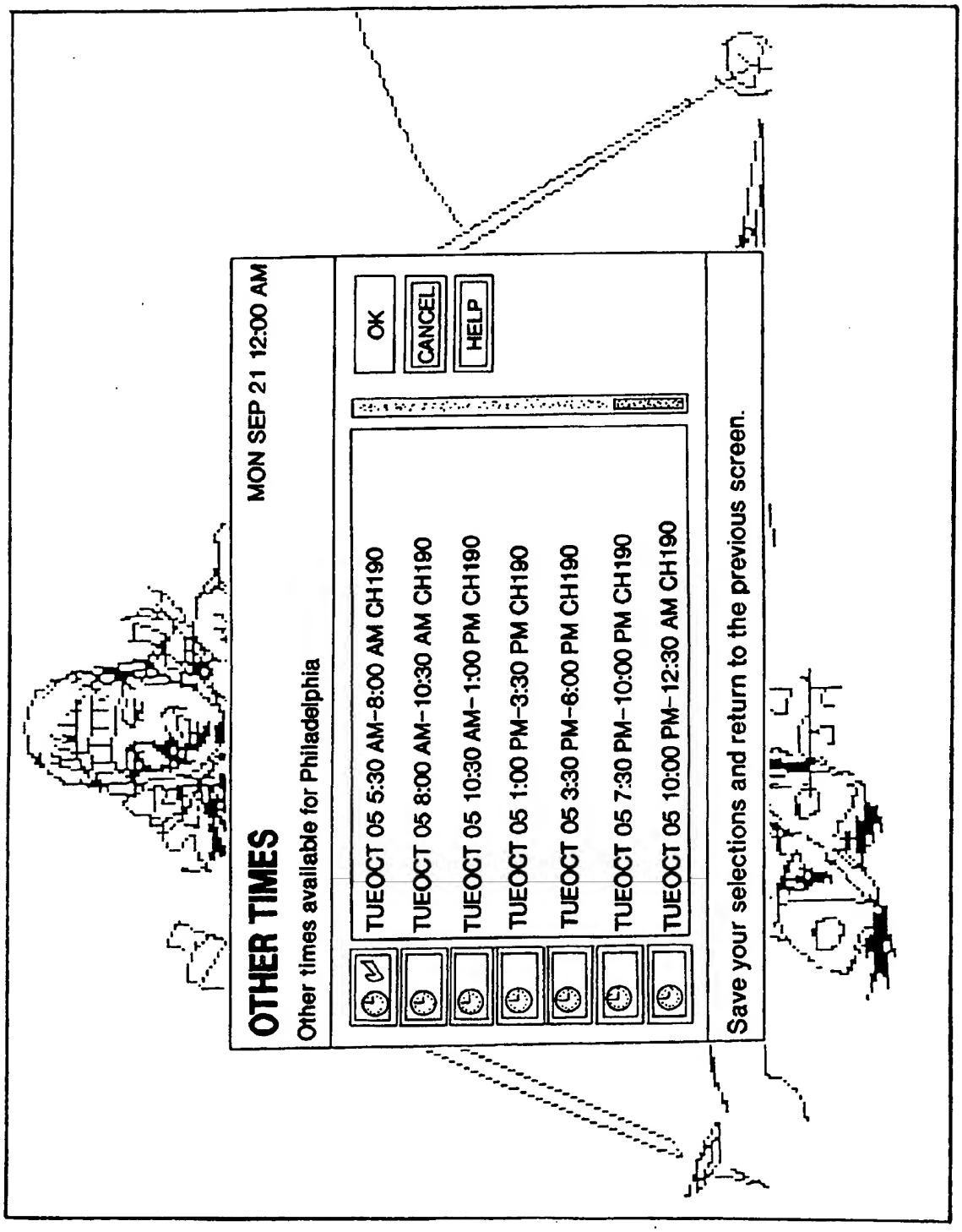
OTHER TIMES
MON SEP 21 12:00 AM
Other times available for Philadelphia
TUEOCT 05 5:30 AM-8:00 AM CH190
TUEOCT 05 8:00 AM-10:30 AM CH190
TUEOCT 05 10:30 AM-1:00 PM CH190
TUEOCT 05 1:00 PM-3:30 PM CH190
TUEOCT 05 3:30 PM-6:00 PM CH190
TUEOCT 05 7:30 PM-10:00 PM CH190
TUEOCT 05 10:00 PM-12:30 AM CH190
OK
CANCEL
HELP
Save your selections and return to the previous screen.

FIG. 27B

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